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COLLEGE OF AGRICULTURE

University of Massachusetts

ANNUAL REPORT

FISCAL 1967

June 1967

OFFICE OF THE DEAN

College of Agriculture

August 1, 1967

Dear President Lederle:

I am transmitting herewith a report of the teaching, research and public service accomplishments of the faculty and nonprofessional staff of the College of Agriculture for the fiscal year ending June 30, 1967.

The College is action-oriented as clearly shown by this report. Without neglecting the scholarly advancement of knowledge or teaching, we strive to put science to work in order to find solutions to urgent problems. Noteworthy examples are: the addition of another dimension to the mission of the College of Agriculture - international agricultural development - which may be heralded as its most significant contribution during the second century of the University, and the continuing education program in water and air pollution biology conducted for the residents of urban and suburban Boston by the Department of Environmental Sciences under a special grant from the Higher Education Act of 1965. Another public service contribution deserving special recognition is the restaurant and food management program developed by the Department of Food Science and Technology for the public school officials administering the school lunch programs. These courses are being offered at Waltham and at Amherst at the request of the Massachusetts Department of Education to improve this important school program. So far, some 60 school lunch people have taken advantage of this opportunity to work for the Associate Degree.

Indicative of the high academic quality of the instruction program is the fact that each year more and more students from other schools and colleges of the University elect courses offered by the College of Agriculture. The total number of students taught has increased from 5,319 in 1961 to 14,325 in 1966, a highly significant increase. Likewise, graduate student majors have increased from less than 100 in 1961 to 249 in 1966.

The proportion of original basic research is increasing as adaptability research is being transferred rapidly from the Experiment Station to Extension. Research productivity of the College scientists ranks among the highest in land-grant universities, according to the official evaluation of the Massachusetts Agricultural Experiment Station conducted recently by the Cooperative States Research Service of the United States Department of Agriculture. Interdisciplinary research activities, along with deep scholarship within each discipline, are characteristic of all departments. However, it must be recorded that the Station program has been considerably reduced in scope because we have been forced to shift state fund support from the Station to the undergraduate program.

Massachusetts, along with California, Iowa and North Carolina, has been selected by the Federal Extension Service to participate in a pilot program to develop more efficient methods for the management of the Cooperative Extension program. Donald P. Allan, Assistant Director of Extension and Experiment Station, was recognized for his pioneering efforts in improving the operations of the Cooperative Extension program by being appointed a consultant for this nationwide undertaking.

I am greatly distressed to have to report that in fiscal 1967 the amount of state funds available for operating the teaching program of the College of Agriculture would have dropped to a dangerously low level if funds had not been shifted from the Experiment Station and from Cooperative Extension. Class enrollments were 5,319 in 1961 and 14,325 in 1966-67, while the total operating funds for Instruction, Control Services, the Experiment Station and Cooperative Extension were about $200,000 and $295,000, respectively. This shift in the use of state budget funds has now reached the point where any further transfer of funds will jeopardize the capability of the College of Agriculture to provide the state funds required to offset Extension and Experiment Station federal funds.

The College of Agriculture has three urgent budgetary needs for marked increase in: (1) operating funds, (2) equipment funds ((15 account)) sufficient to modernize classrooms and laboratories, and (3) additional positions to provide essential technical support to faculty in the undergraduate and graduate instruction programs.

We shall continue to emphasize standards of excellence, sensitivity to the needs of society, and responsiveness and adaptability in the face of change.

Respectfully submitted

A. A. Spielman

A. A. Spielman
Dean

AAS:MRE

OFFICE OF THE DEAN AND DIRECTOR

ADMINISTRATIVE RESPONSIBILITIES OF THE DEAN AND DIRECTOR

A. College of Agriculture
- undergraduate instruction
- graduate instruction

B. Stockbridge School of Agriculture
- associate degree program

C. Massachusetts Agricultural Experiment Station
- Amherst campus
- Waltham Field Station
- Cranberry Station, East Wareham
- U. S. Department of Agriculture
- Cooperation with 12 Northeastern State Experiment Stations

D. Cooperative Extension Service
- Amherst, Waltham, and East Wareham campuses
- twelve cooperating county governments
- U. S. Department of Agriculture
- School of Home Economics
- Cooperation with 12 Northeastern State Extension Services

E. State Control Service (Statutory Responsibilities)
- feed, seed, fertilizer composition
- dairy laws
- shade tree laboratories
- poultry disease control
- mastitis (dairy cattle) disease control

F. Massachusetts Civil Defense Training Program
- U. S. Department of Defense
- Massachusetts Director of Civil Defense
- Rural Civil Defense, Northeastern U. S. Region

G. International Agricultural Training Program
- U. S. Department of State - Agency for International Development
- University of Malawi

H. Cooperative Wildlife Research Unit
- U. S. Department of the Interior
- Massachusetts Department of Natural Resources

I. Cooperative Fisheries Research Unit
- U. S. Department of the Interior
- Massachusetts Department of Natural Resources

J. Community Service and Continuing Education Program, Title I, Higher Education Act of 1965
- U. S. Department of Health, Education and Welfare, Office of Education
- Massachusetts Higher Education Act Commission

SPECIAL PUBLIC SERVICE ASSIGNMENTS

1. Member State Committee for Conservation of Soil, Water and Related Resources
   - appointed under Chapter 64, General Laws, Commonwealth of Massachusetts

2. Member of Special Study Commission of the General Court regarding the County Extension Program
   - designee of President John W. Lederle

3. New England Council for Economic Development representing Massachusetts Extension Service
   - by invitation of Committee on Expansion of Tourist Industry

4. National Legislative Committee of Cooperative Extension Service representing the Northeast
   - appointed by Extension Committee on Organization and Policy

5. Board of Governors National Agricultural Hall of Fame
   - elected by Executive Committee

6. Committee for International Agricultural Extension, National Association of Land-Grant Colleges and State Universities
   - appointed by Chairman of Extension Section

7. State Advisory Council on Community Service and Continuing Education Programs under Title I of the Higher Education Act of 1965
   - appointed by the Director

8. Massachusetts Administrator for McIntire-Stennis Cooperative Forestry Research Program - appointed by the Governor of Massachusetts

9. Member Massachusetts Economic Stabilization Board
   - appointed by the Governor

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COLLEGE OF AGRICULTURE

1966-67

SECTION I -- GENERAL

APPROPRIATIONS

PERSONNEL - NUMBER IN EACH RANK

ORGANIZATION CHARTS

STUDENTS

FACULTY

COLLEGE OF AGRICULTURE

APPROPRIATIONS

Year	State Funds	Federal Funds
1963-64	$3,002,241.00	$1,121,096.00
1964-65	3,140,288.00	1,243,524.00
1965-66	3,252,086.00	1,334,741.00
1966-67	3,472,592.00	1,467,804.00

COLLEGE OF AGRICULTURE

PERSONNEL - NUMBER IN EACH RANK

Academic Personnel	September 1964	September 1965	September 1966
Dean	1	1	1
Associate Dean and Director of Stockbridge School	1	1	1
Associate Director of Extension	1	1	1
Commonwealth Head of Department	1	1	1
Head of Department "A"	11	7	8
Head of Department, academic year	0	1	1
Commonwealth Professor "A"	1	1	0
Commonwealth Professor, academic year	1	1	1
Professor "A"	43	45	42
Professor, academic year	5	7	6
Associate Professor "A"	33	38	39
Associate Professor, academic year	3	5	5
Assistant Professor "A"	45	40	37
Assistant Professor, academic year	8	16	16
Assistant Professor, academic year, $\frac{1}{2}$ time	1	0	0
Instructor "A"	20	13	13
Instructor "A", $\frac{1}{2}$ time	4	0	0
Instructor, academic year	3	1	2
Instructor, academic year, $\frac{1}{2}$ time	1	2	2
Visiting Lecturer	1	2	1
Lecturer	0	0	1
Lecturer, $\frac{1}{2}$ time	0	1	1
Sabbatical Leave	6	3	5
Leave Without Pay	3	1	2
TOTAL (does not include vacancies)	193	188	186

Non-academic Personnel			
Assistant to Dean	1	1	0
Assistant Director of Experiment Station-Extension Service	0	0	1
Staff Associate	2	2	1
Staff Assistant	0	2	3
TOTAL	3	5	5

COLLEGE OF AGRICULTURE

RESIDENT INSTRUCTION
(Stockbridge, Undergraduate, Graduate)

Dean
Associate Dean
Assistant to Dean

Agricultural and Food Economics
- Department Head
- Faculty

Agricultural Engineering
- Department Head
- Faculty

Entomology and Plant Pathology
- Department Head
- Faculty

Environmental Sciences
- Department Head
- Faculty

Food Science and Technology
- Department Head
- Faculty

Forestry and Wildlife Management
- Department Head
- Faculty

Landscape Architecture
- Department Head
- Faculty

Plant and Soil Sciences
- Department Head
- Faculty

Veterinary and Animal Sciences
- Department Head
- Faculty

COLLEGE OF AGRICULTURE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

Director
Assistant Director

Departments

Agricultural and Food Economics

Agricultural Engineering

Cranberry Station

Entomology and Plant Pathology

Environmental Sciences

Food Science and Technology

Forestry and Wildlife Management

Landscape Architecture

Plant and Soil Sciences

Veterinary and Animal Sciences

Control Programs

Feed, Fertilizer, Seed, and Dairy Law

Mastitis Control

Pullorum Control

Shade Tree Laboratories

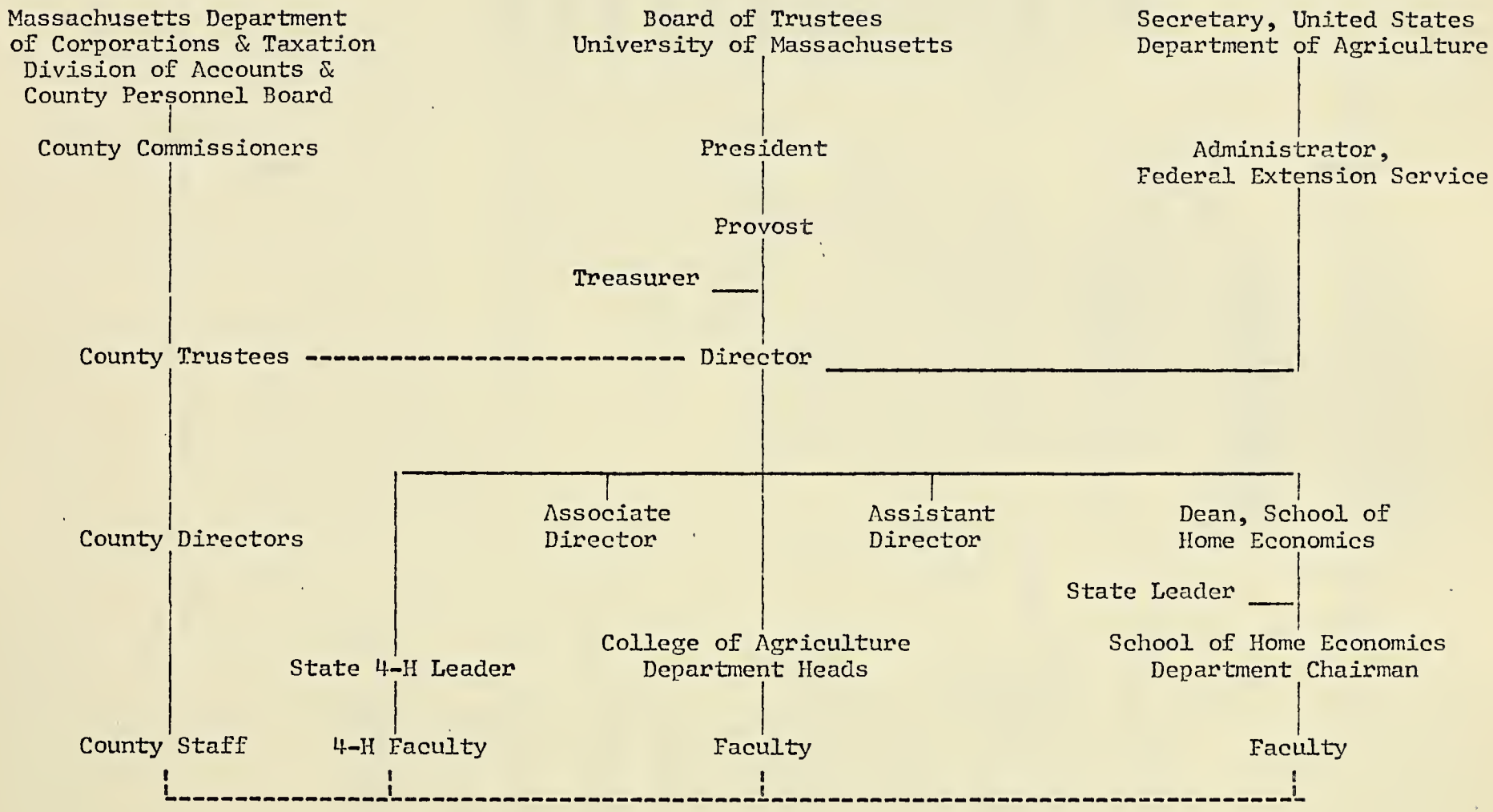
COLLEGE OF AGRICULTURE

NON-RESIDENT INSTRUCTION (COOPERATIVE EXTENSION)

Director
Associate Director
Assistant Director

College of Agriculture Departments	School of Home Economics Departments	Cooperating Agencies
Agricultural and Food Economics	Art and Design	Barnstable
Agricultural Engineering	Consumer Education	Berkshire
Cranberry Station	Family Housing	Bristol
Entomology and Plant Pathology	Human Development	Dukes
Environmental Sciences	Leadership Development	Essex
Food Science and Technology	Management	Franklin
Forestry and Wildlife Management	Nutrition and Health	Hampden
4-H and Youth Programs		Hampshire
Plant and Soil Sciences		Middlesex
Veterinary and Animal Sciences		Norfolk
		Plymouth
		Worcester

MASSACHUSETTS COOPERATIVE EXTENSION PROGRAM
ORGANIZATION CHART



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COLLEGE OF AGRICULTURE

STUDENTS

1966-67

Enrollments (Majors)

Class Enrollments

Graduate, Post-Doctoral Fellows

Entrance Applications - Stockbridge

COLLEGE OF AGRICULTURE

STUDENT ENROLLMENT (MAJORS) - FALL SEMESTER

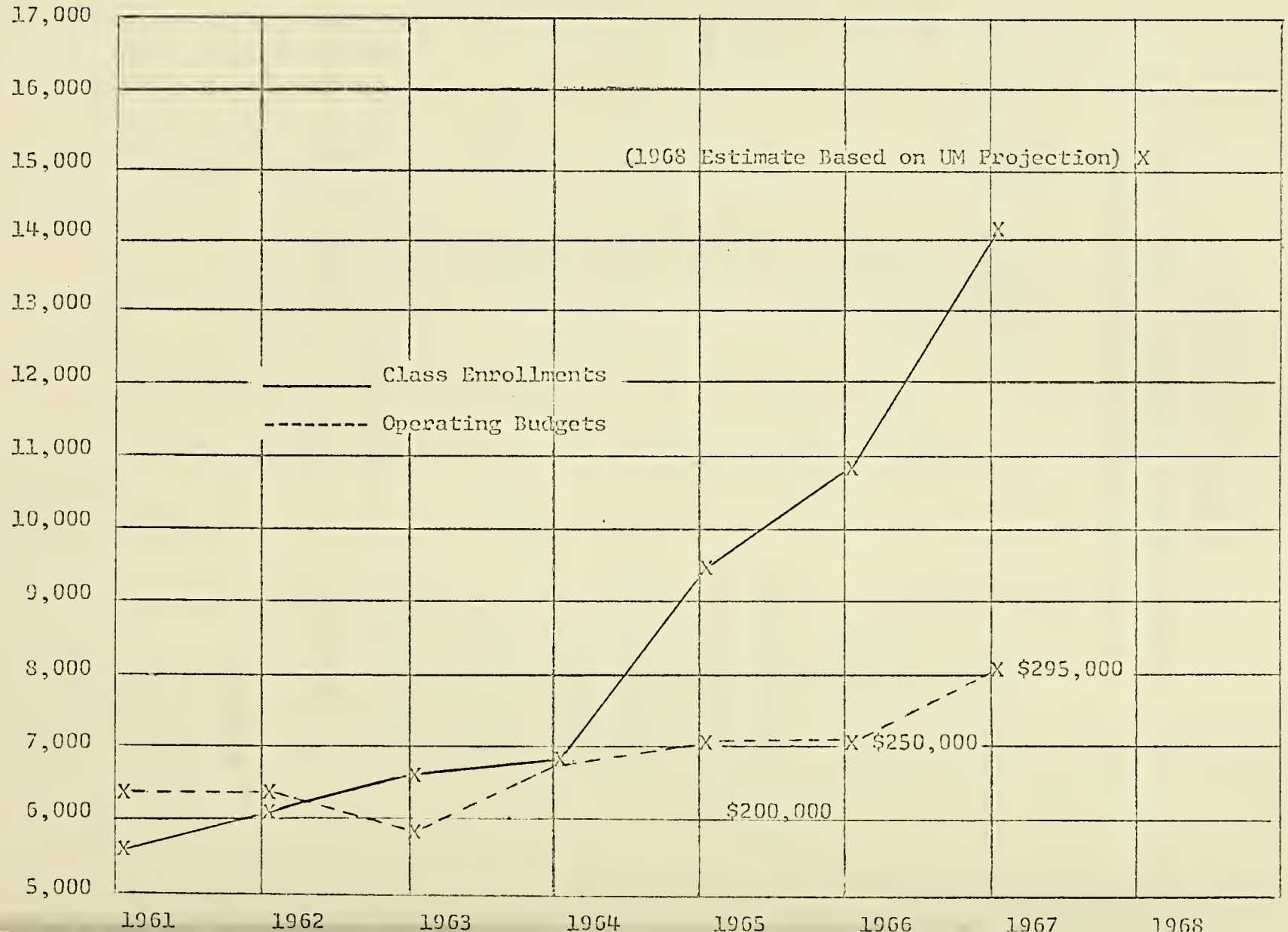
(GRADUATE, UNDERGRADUATE, STOCKBRIDGE)

Department	1964	1965	1966
Agricultural and Food Economics	53	77	90
Agricultural Engineering	20	21	21
Entomology and Plant Pathology	33	34	34
Food Science and Technology	195	243	255
Forestry and Wildlife Management	212	260	345
Landscape Architecture	216	253	277
Plant and Soil Sciences	167	186	190
Veterinary and Animal Sciences	152	160	171
Totals	1,048	1,234	1,383

6/6/67

COLLEGE OF AGRICULTURE

CLASS ENROLLMENTS AND OPERATING BUDGETS



COLLEGE OF AGRICULTURE

(GRADUATE, POST-DOCTORAL FELLOWS)

Department	Graduate Students M.S.	Graduate Students Ph.D.	Degrees Awarded M.S.	Degrees Awarded Ph.D.	Post-Doctoral Fellows
Agricultural and Food Economics	27	-	5	-	-
Agricultural Engineering	10	4	3	-	-
Cranberry Station	2	1	-	-	2
Entomology and Plant Pathology	17	11	8	2	-
Environmental Sciences	5	5	3	2	4
Food Science and Technology	21	23	5	9	4
Forestry and Wildlife Management	43	2	16	-	-
4-H and Youth Programs	1	-	1	-	-
Landscape Architecture	30	-	2	-	-
Plant and Soil Sciences	17	3	9	1	-
Veterinary and Animal Sciences	16	11	4	3	2
Totals	189	60	56	17	12

STOCKBRIDGE SCHOOL OF AGRICULTURE

APPLICATIONS FOR ENTRANCE SEPTEMBER, 1966

	Number Received	Number Accepted	Number Rejected	Number Enrolled
Agricultural Business Management	13	7	6	4
Animal Science	110	62	48	46
Arboriculture and Park Management	166	71	95	48
Dairy Technology	23	18	5	12
Floriculture	36	25	11	20
Food Distribution	31	19	12	12
Fruit and Vegetable Crops	11	9	2	8
Landscape Operations	68	33	35	26
Restaurant and Hotel Management (Food)	152	72	80	47
Turf Management	95	61	34	47
Wood Utilization	53	31	22	23
Totals	758	408	350	293

STOCKBRIDGE SCHOOL PLACEMENT
Class of 1966

Indicative of the quality of applicants to the Stockbridge School is the fact that more than one-third (35%) of the 179 members of the Class of 1966 are working for their B.S. degrees at UMass and other universities and colleges.

Graduates working in their major field totaled 80 or 45% of the class. Placement of graduates included Assistant to Research Consultant, Hydroponics Inc. (animal science); work with state and city park departments (arboriculture and park management); food service industry (restaurant and hotel management); golf course superintendents (turf management); Firestone Tire & Rubber Company (fruit and vegetables); and Fellow at Arnold Arboretum (floriculture).

Leading all fields in the number of graduates was arboriculture and park management with 44 followed by turf management (29), animal science (24), restaurant and hotel management (21), and landscape operations (20).

COLLEGE OF AGRICULTURE

FACULTY

1966-67

Publications

Research Grants

Other Professional Activities

COLLEGE OF AGRICULTURE

FACULTY PUBLICATIONS

1966-67

AGRICULTURAL AND FOOD ECONOMICS

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William G. Sheldon	Massachusetts Division of Fisheries and Game	9,400.00
William G. Sheldon	U. S. Fish and Wildlife Service	17,000.00
William G. Sheldon	U. S. Fish and Wildlife Service	2,000.00
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Glenn H. Snoeyenbos	Fats and Proteins Research Foundation, Inc.	16,000.00
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Technical Committee, Northeast Regional Research Project NEM-37; serves as Secretary of this group
Technical Committee, Northeast Regional Research Project NEM-21

Wyckoff, J. B.

Vice President and Editor, Western Farm Economics Association
Member, Executive Committee, Western Farm Economics Association
Chairman, Awards Committee, Western Farm Economics Association, 1966
Executive Committee, New England Agricultural Economics Research Council
Chairman, Natural Resources Subcommittee, New England Agricultural Economics Council
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Vice President, Western Massachusetts Tree Wardens and Moth Superintendents Association
Authorized by American Phytopathological Society Council to seek grant in their name for publication of Phytopathological Translations

McKenzie, Malcolm A.

21st and 22nd Annual Conferences on Dutch Elm Disease
Executive Committee, Northeastern Forest Pest Council
Advisor, Horticultural Newsletter
Advisory Council, TREES, "The Journal of American Arboriculture"
Committee, Tree Wardens, Arborists and Utilities Conference
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Chairman, Committee of Esturine Pollution, American Public Health Association
Subcommittee, Standard Methods for Analysis of Water and Wastewater, American Public Health Association
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Member, Committee on Guarantees and Tolerances, and Investigator, Nitrogen Products, Association of American Fertilizer Control Officials (USA and Canada)

Rice, William N.

Chairman, Noxious Weed Seed Committee of Northeastern Section; Member and Representative of Referee Committee of Northeastern Region; Member of Meeting Place Committee; and Member of Administrative Committee of Seed Control Officials of Northeastern States, Association of Official Seed Analysts (USA and Canada)

Smith, C. Tyson

Chairman, Methods Committee, American Association of Feed Microscopists (USA and Canada)
Associate Referee, Feed Microscopy, Association of Official Analytical Chemists

4-H AND YOUTH PROGRAMS

Metcalfe, William W.

Membership Committee, Epsilon Sigma Phi
Vice President; Chairman, Membership Committee; Chairman, Annual Conference, and Chairman, Ad Hoc Committee on Private Financial Support, Adult Education Association in Massachusetts
Member, National Delegate Assembly, and Nominations and Elections Committee, Adult Education Association of the USA

FOOD SCIENCE AND TECHNOLOGY

Buck, Ernest M.

Director, New England Livestock Conservation, Inc.
Vice President and President Elect, Phi Tau Sigma (U-Mass Chapter)

Clydesdale, F. M.

Member, Program Committee, U-Mass Chapter, Phi Tau Sigma

Cournoyer, Norman G.

Member, Board of Trustees, Student Union

Eshbach, Charles E.

Member, 15th Annual Food Management Seminar Committee, The Massachusetts Food Service Educational Council

Esselen, William B.

Chairman, Scientific Lectureship Committee, Institute of Food Technologists
Membership on National Academy of Sciences - National Research Council Advisory Board on Military Personnel Supplies: (1) General Committee on Food; (2) Committee on Microbiology of Food; and (3) Task Group on Microbiological Safety of Radio-Sterilized Foods

Evans, David A.

President and Member, Executive Committee, Massachusetts Dairy Technology Society
Member, Task Force Committee on Rating and Certification of Milk Supplies, Conference on Interstate Milk Shipments, Miami, Fla.

Francis, Frederick J.

Membership on Institute of Food Technologists: (1) Committee on Constitution and By-Laws, and (2) Committee on Appointments

Hankinson, Denzel J.

Member, Committee for Selecting American Dairy Science Association's Dairy Science Teaching Award

Hayes, Kirby M.

Director, Research and Development Associates, U. S. Army Natick Laboratories
Treasurer and Elected Vice Chairman, Northeast Section, Institute of Food Technologists
Member, Institute of Food Technologists Annual Meeting Program Committee and Committee on Education (Scholarships Subcommittee)

Hayes, Kirby M.

Councilor, Phi Tau Sigma
Member, ASHRAE Technical Committee on Frozen Foods

Hultin, Herbert O.

Chairman, Undergraduate Scholarship Committee, Northeast Section, Institute of Food Technologists
Member, Food Chemistry Subcommittee, Institute of Food Technologists Educational Committee

Hunting, Ward M.

New England Representative, Institute of Food Technologists Subcommittee on International Technical Assistance
President, Phi Tau Sigma Honorary Society, U-Mass Chapter
Member, Committee on Constitution Revision, National Society
Resident Clerk, Commonwealth of Massachusetts, National Society

Levin, Robert E.

Secretary-Treasurer Elect, Phi Tau Sigma, U-Mass Chapter

Potter, Frank E.

Member, Board of Directors, New England Group of National Ice Cream Retailers' Association

Sawyer, F. Miles

Member, Committee on Quality Control of Food Products, Institute of Food Technologists
Member, Advisory Committee of American Society of Heating, Refrigerating and Air Conditioning Engineers Technical Committee 7.4, Frozen Foods

Stumbo, Charles R.

Member, National Academy of Sciences - National Research Council Advisory Board on Military Personnel Supplies: Food Irradiation Advisory Committee to the Armed Forces

FORESTRY AND WILDLIFE MANAGEMENT

Abbott, Herschel G.

Reforestation Subcommittee, Power and Machinery Division, American Society of Agricultural Engineers
Secretary-Treasurer; Vice Chairman, Nominating Committee, Society of American Foresters
Treasurer, Sigma Xi, Massachusetts Chapter

Bond, Robert E.

Executive Committee, Society of American Foresters

Brander, Robert B.

Resolutions Committee, Manual of Wildlife
Investigational Techniques Committee, Northeast Section, Wildlife Society

Carlozzi, Carl A.

Recreation Advisory Council, Massachusetts Board of Natural Resources
Planning Committee, National Conference on "University and the Environment, Conservation Foundation

Gatslick, Harold B.

New England Committee, Building Code Improvement
Executive Secretary, New England Kiln Drying Association
Director, Northeast Section, Forest Products Research Society
Treatments and Coatings Committee, Forest Products Research Society
Wood Drying Committee, Forest Products Research Society
Wood Committee, Building Research Institute, National Academy of Sciences and National Research Council
Visiting Scientist Lecturer, Society of Wood Science and Technology

Greeley, Frederick

Chairman, Northeast Section, Wildlife Society
Chairman, By-Laws Committee, Northeast Section, Wildlife Society

Hoadley, R. Bruce

Treasurer, Forest Products Research Society

Mader, Donald L.

Nominating Committee, Forest and Range Soils Division, Soil Science Society of America

McCann, James A.

Committee, Professional Certification and Standards, American Fisheries Society
Chairman, Membership Committee, Northeast Section, American Fisheries Society

Noyes, John H.

Committee, International Relations, Society of American Foresters
Awards Committee, and Executive Committee, New England Section, Society of American Foresters

Rhodes, Arnold D.

President, Alumni Council, Yale School of Forestry
Executive Committee, Council of Forestry School Executives
Vice Chairman, Advisory Council to Northeastern Forest Experiment Station, U. S. Forest Service
Chairman, Northeast Region, Association of State College and University Forestry Research Organizations
Member, Massachusetts Board of Natural Resources

Scheffey, Andrew J. W.

Alumni Council, School of Natural Resources, University of Michigan
Natural Resources Committee and Foundation for Conservation Law, New England Council
Recreation Advisory Council and Higher Education Facilities Committee, Massachusetts Board of Natural Resources

Sheldon, William G.

Executive Committee, Northeast Section, Wildlife Society
Director, Association of Conservation Commissions, Massachusetts Board of Natural Resources

LANDSCAPE ARCHITECTURE

Bacon, Theodore S., Jr.

Member, Reorganization Committee, New England Chapter, American Institute of Planners
Member, Governor's Advisory Committee on State and Local Planning

Kent, Robert L.

Member, Committee on Schools, American Society of Landscape Architects

King, Gordon S.

Board of Directors, International Shade Tree Conference
Member, Education Committee, National Recreation and Park Association
Chairman, Education Committee, Massachusetts Arborists' Association
Chairman, Education Committee, Massachusetts Tree Wardens and Foresters Association

Whitney, Earle D.

Member, Education Committee, Curriculum Committee and Training and Recruitment Committee, National Recreation and Park Association

Zube, Ervin H.

Member, Executive Committee, Boston Society of Landscape Architects
Member, National Committee on Career Guidance, American Society of Landscape Architects

PLANT AND SOIL SCIENCES

Drake, Mack

Consulting Editor, Soil Science
Consulting Editor, Agronomy Journal

Havis, John R.

Member, Program Committee, Horticultural Crops Section, Northeastern Weed Control Conference

Michelson, Louis F.

Member, Ad Hoc Committee, U S. Department of Health, Education and Welfare (concerned with "Cooperative Project for Standardization of Terminology in Instructional Programs of Local and State School Systems")

Southwick, Franklin W.

1966-67 President, Northeastern Region, American Society for Horticultural Science
Member, Awards Committee, American Society for Horticultural Science (determined outstanding research papers in Volumes 86 and 87, 1965, proceedings of Society)
Member, Committee on Nominations, Elections and Appointments, American Society for Horticultural Science

Warkentin, Benno P.

Member, Committee SGF-C3 (Physico-Chemical Phenomena in Soils), Highway Research Board, National Academy of Sciences - National Research Council

Weeks, Martin E.

Member, Northeastern Soil Survey and Land Use Committee on Urban Use of Land

Weeks, Walter D.

Chairman, True-to-Name Nursery Program Committee, American Pomological Society

VETERINARY AND ANIMAL SCIENCES

Stern, Douglas N.

Vice President, American Association of Extension Veterinarians
Secretary-Treasurer, Western Massachusetts Veterinary Medical Association

Fox, Thomas W.

Constitution Committee, Poultry Science Association
Chairman, Poultry Science Hoblizelle Research Awards Committee

Colby, Byron E.

First Vice President, Extension Committee, American Society for Animal Science

Foley, Richard C.

Executive Committee, Phi Kappa Phi, Massachusetts Chapter

Gaunt, Stanley N.

Chairman, Resolutions Committee, American Dairy Science Association

Mellen, William J.

Secretary, Sigma Xi, Massachusetts Chapter
President, Phi Kappa Phi, Massachusetts Chapter
Editorial Referee, General and Comparative Endocrinology

Snoeyenbos, Glenn H.

Secretary-Treasurer, American Association of Avian Pathologists
Committee on History, American Association of Avian Pathologists
Committee on Constitution and By-Laws, American Association of Avian Pathologists
Business Manager, Avian Diseases (quarterly journal), American Association of Avian Pathologists
Secretary, Northeastern Conference on Avian Diseases
Chairman, Antigen Committee, Northeastern Conference on Avian Diseases
Member, Nomenclature and Disease Reporting Committee
Chairman, Poultry Section, A.V.M.A.

Smyser, Charles F., Jr.

Member, Antigen Committee, Northeastern Conference on Avian Diseases

COLLEGE OF AGRICULTURE

FACULTY AWARDS, CITATIONS, AND

PROFESSIONAL RECOGNITION

AGRICULTURAL AND FOOD ECONOMICS

Bell, Ellsworth W.

Granted 11-month Sabbatic Leave by Trustees of University of Massachusetts
Received Fulbright-Hays Award as Visiting Lecturer at Hokkaido University, Sapporo, Japan

Bragg, John H.

Elected to Beta Gamma Sigma, Business Honorary Fraternity
Appointed to Graduate Faculty, University of Massachusetts

Crossmon, Bradford D.

Received Research Grant from Agricultural Development Council to study marketing schemes on Federal Land Development Authority in Malaysia

Engel, N. Eugene

Completed all requirements and awarded a Ph.D. degree in Agricultural Economics, University of Connecticut, June 1967

Fitzpatrick, Robert A.

Nominated for Outstanding Teacher in College of Agriculture, 1966-67

Jarvesoo, Elmar

Recipient of Fulbright-Hays Grant to lecture on problems of economic growth, School of Economics and Business Administration, Helsinki, Finland, and Swedish School of Economics for fall semester 1966.
Also, lectured at School of Agriculture and Forestry at University and at U. S. Information Center, Helsinki, Finland

Russell, Sargent

Recipient of Fulbright-Hays Lectureship at Ege University, Izmur, Turkey, for academic year 1967-68

Wyckoff, J. B.

Recipient of Travel Grant from International Conference of Agricultural Economists to attend 13th International Conference, Sidney, Australia, August 1967.
Appointed to Graduate Faculty, University of Massachusetts

AGRICULTURAL ENGINEERING

Fitzgerald, Gerald A.

Received Blue Ribbon Award (publication class) for bulletin, Procurement of Foods by Grocers, at 1966 Annual Meeting of American Society of Agricultural Engineers

Johnson, Curtis A.

Invited to, and attended, first International Water for Peace Conference; 6,400 representatives from 84 different countries present

Pira, Edward S.

Received Blue Ribbon Award for instructional display, System Design for Golf Course Irrigation, at 1966 Annual Meeting of American Society of Agricultural Engineers

CRANBERRY STATION

Cross, Chester E.

Visiting scientist at Hokkaido University, Sapporo, Japan (June and July 1967), under sponsorship of Japan Society for Promoting Agriculture; conducted lecture and seminar work

Zuckerman, Bert M.

Invited to serve in U. S. Department of State Cultural Exchange Program, Poland, summer 1967.

ENTOMOLOGY AND PLANT PATHOLOGY

Becker, William B.

Reappointed (by State Forester) as one of five representatives from Massachusetts on Northeastern Forest Pest Council
Reelected Vice Chairman of Northeastern Forest Pest Council at winter meeting in March 1967
Grant of $500 from Shell Chemical Company for aid in research

Hanson, John F.

Consultant to Smithsonian Institute, Washington, D. C., and its commissioned sculptor in sculptoring of a 14-foot grasshopper to be installed in entrance to insect museum. Giant grasshopper will be one of most expensive biological museum models ever made with unprecendented fine detail of internal and external anatomy.

Holmes, Francis W.

Invitational speaker for four talks on "Salt Injury to Trees," Snow and Ice Control Section of Highway School, Cornell University, Ithaca, N. Y., July 11-12, 1966
Invitational speaker on talk "Salt Injury to Trees" in meeting sponsored by American Public Works Association, Milwaukee, Wis., March 1967

Lilly, John H.

Secretary, Phi Kappa Phi, Massachusetts Chapter, 1965-66
Faculty Fellow, Eugene Field House, 1965-66
Program Specialist in Entomology (India), Ford Foundation, 1967-68

Shaw, Frank R.

Grant of $500 from Shell Chemical Company for aid in research

Wave, Herbert E.

Elected Chairman, New England Agricultural Chemicals Conference
Grant of $500 from Shell Chemical Company for aid in research

ENVIRONMENTAL SCIENCES

Faddoul, George P.

Accepted for membership, the New York Academy of Sciences, March 1967

Feder, William A.

Invited to give paper at 100th Anniversary of Citrus Experiment Station, University of California, Riverside, Calif., March 1968

Gunner, Haim B.

Invited to participate as Visiting Scientist, National Science Foundation, Boston College Program for Secondary Schools in Massachusetts, 1966-67

Litsky, Warren

Appointed Professor (Affiliate) of Bacteriology, Clark University, Worcester, Mass.

Naegele, John A.

Invited to participate in forthcoming Entomological Society American Symposium on Resistance as one of ten leading scientists in acarine resistance, Baltimore, Md., October 1967

FEED, FERTILIZER LAWS, SEED LABORATORY

Kuzmeski, John W.

Commissioned as officer of Federal Food and Drug Administration as professor in charge of feed, fertilizer, seed and dairy laws

Rice, William N.

Served on Faculty Senate
Served on College of Agriculture Personnel Committee

FOOD SCIENCE AND TECHNOLOGY

Buck, Ernest M.

Awarded Ph.D. degree in Food Science and Technology

Cournoyer, Norman G.

Named "Professor of the Year" in Stockbridge School of Agriculture

Eshbach, Charles E.

One of limited number of members of University staff doing Extension work asked to provide information on Extension work, operations and reporting to special team studying new reporting methods

Francis, Frederick J.

Appointed one of Institute of Food Technologists panel of Scientific Lecturers for 1966-67. Presented ten lectures on food color throughout the country

Hankinson, Denzel J.

Received FFA Honorary Bay State Farmer, March 31, 1967

Hayes, Kirby M.

Member of Technical Advisory Board, Quick Frozen Foods

Nawar, Wassef W.

One of two University faculty members elected to Phi Kappa Phi for 1966-67

Wrisley, Albert L.

Elected to Beta Gamma Sigma, Business Honorary Society

FORESTRY AND WILDLIFE MANAGEMENT

MacConnell, William P.

Outstanding Teacher, College of Agriculture, University of Massachusetts

McCann, James A.

Meritorius Service Award, U. S. Fish and Wildlife Service

Noyes, John H.

Award for Outstanding Service to Forestry, Northeast Loggers Association

Sheldon, William G.

Meritorius Service Award, U. S. Fish and Wildlife Service

4-H AND YOUTH PROGRAMS

Boss, Marvin W.

Awarded Grant Foundation Fellowship for study at Institute of Child Study, University of Maryland, College Park, Md.

Metcalfe, William W.

Elected to Faculty Senate for three-year term, 1967

PLANT AND SOIL SCIENCES

Drake, Mack

Received $5,000 from Gulf Oil Corporation to study response of crops to various petroleum products

Maynard, Donald N.

Received $5,000 from Gulf Oil Corporation to study response of crops to various petroleum products

Awarded $7,500 grant from Massachusetts Society for Promoting Agriculture to study potassium-ammonium relationships in plants, 1966-1968

Awarded $2,000 from American Potash Institute to study role of potassium for ammonium utilization in plants

Southwick, Franklin W.

Received $1,000 grant from UniRoyal Corporation to continue studies on response of apple trees to M-dimethyl-amino succinamic acid

Thomson, Cecil L.

Received $1,500 from Oxford Pickle Company to support research related to cucumber pickle problems

Troll, Joseph

Appointed member of Golf Course Superintendents' Association of New England

Zak, John M.

Department of Plant and Soil Sciences, primarily through Project Leader Zak, has been awarded a five-year contract of $250,000 (1967-1972) from Massachusetts Department of Public Works to support a Roadside Development Research Project

VETERINARY AND ANIMAL SCIENCES

Fenner, Heinrich

Recipient of Faculty Travel Grant to International Symposium on Silage Preservation, Rostock, East Germany, 1966

Gaunt, Stanley N.

Recipient of Faculty Travel Grant to International Dairy Congress, Munich, Germany, 1966

Sevoian, Martin

Recipient of Travel Grant from World's Poultry Science Association to 13th World's Poultry Congress, Kieve, Russia, 1966

COLLEGE OF AGRICULTURE

FACULTY PARTICIPATION IN

PROFESSIONAL MEETINGS

AGRICULTURAL AND FOOD ECONOMICS

Fitzpatrick, Robert A.

Symposium in Teaching, American Farm Economics Association sponsored workshop, Virginia Polytechnic Institute, Blacksburg, Va.

Lecturer to Chicopee School Association, sponsored by Council in Economic Education, Chicopee, Mass.

Leed, Theodore W.

Presented paper, "Changes in Market Structure in the Food Wholesaling and Retailing in New England," New England Agricultural Economics Council, Orono, Me., June 26, 1967.

Russell, Sargent

Presented paper, "The Turkey Experience in Cooperatives," Agricultural Development Council Seminar on Cooperatives, University of Kentucky, Lexington, Ky., May 1967.

Wyckoff, J. B.

Chairman, Awards Presentation Section of Western Farm Economics Association Meeting, Los Angeles, Calif., August 1966. Presented awards for the outstanding research publication, the outstanding master's thesis, and the outstanding Extension program in Agricultural Economics.

Served as General Chairman for December meeting of the Committee on the Economics of Water Resources Development, Las Vegas, Nev.

Presented paper, "Adjustments in the Program of the Department of Agricultural and Food Economics, University of Massachusetts," New England Agricultural Economics Council, Orono, Me., June 26, 1967.

AGRICULTURAL ENGINEERING

Clayton, J. T.

Presented paper, "A Heat Flux Calorimeter for the Study of Thermal Exchange in Chickens," Fourth Congress of the International Society of Biometeorology, Rutgers University, New Brunswick, N. J., August 1966.

Participated in committee meetings in conjunction with 1966 Winter Meeting, American Society of Agricultural Engineers, Chicago, Ill., December 1966.

Critical reader for three papers submitted for publication in the Transactions of the ASAE.

Fletcher, Stevenson W., III

Presented paper, "Evaluating New Containers for Food Distribution," Annual Meeting of the North Atlantic Region, ASAE, The Pennsylvania State University, University Park, Penn., August 1966.

Johnson, Curtis A.

Recommended standard for "Terminology for Mechanical Milking Machine Systems," developed during term as Chairman of the Milk Handling Committee, and published in 1967 Yearbook of the American Society of Agricultural Engineers.

Light, Robert G.

Presented paper, "Veal Calf Housing Design," 1967 Annual Meeting of New England Farm Electrification Institute, University of Maine, Orono, Me., January 1967.

Pira, Edward S.

Presented paper, "Teaching Aids for Youth Programs," 1967 Annual Meeting of New England Farm Electrification Institute, University of Maine, Orono, Me., January 1967.

Whitney, Lester F. (with H. M. Agrawal and R. B. Livingston)

Presented paper, "The Effects of Stomato Opening on Drying Alfalfa Leaves and Orchard Grass," 1966 Winter Meeting of ASAE, Chicago, Ill., December 1966.

(with E. S. Pira and K. Muta)

Presented paper, "The Effects of Soil Profiles on Sub-Surface Irrigation," 1967 Annual Meeting, ASAE, University of Saskatchewan, Saskatoon, Canada, June 1967.

Presented papers, "Harvesting Aids for Apples," Annual Meetings of (1) Horticultural Society, December 1966, and (2) New York Horticultural Society, January 1967.

Zahradnik, John W.

Presided at session of Food Engineering Program, 1966 Winter Meeting, ASAE, Chicago, Ill., December 1966.

Presented paper, "Residence-Time Distribution in a Scraped Surface Heat Exchanger," 1966 Winter Meeting, ASAE, Chicago, Ill., December 1966.

Presented two papers, "Computer Thermal Process Determination for Conduction Heated Foods," and "Chemical Analogue Model for the Calibration of Thermal Destruction Apparatus," Annual Meeting of Institute of Food Technologists, Minneapolis, Minn., May 1967.

Zahradnik, John W.

Critical reader for five papers submitted for publication in Transactions of the ASAE, and two papers submitted for publication in the Journal of the Institute of Food Technologists.

CRANBERRY STATION

Devlin, Robert M.

Presented paper at Proceedings of Northeastern Weed Control Conference, New York City.

Presented paper at New England Regional Meeting of American Society for Horticultural Science, Harvard University, Cambridge, Mass.

Zuckerman, Bert M.

Invitational speaker, First East Coast Symposium on "Ecology of Root-Infecting Organisms," University of Maryland, College Park, Md., April 3-4, 1967.

ENTOMOLOGY AND PLANT PATHOLOGY

Agrios, George N.

Attended Regional Meeting of Northeastern Division of American Phytopathological Society, The Pennsylvania State University, University Park, Penn., November 8-10, 1966.

Attended meeting of Technical Committee of NE-14, "Virus Diseases of Deciduous Tree Fruits and Their Control," New York City, January 8-9, 1967, and presented results obtained and work underway at this station.

Banfield, Walter M.

Attended Northeastern Division of American Phytopathological Society, The Pennsylvania State University, University Park, Penn., November 3-4, 1966.

Attended Northeastern Forest Pathologists Workshop, University of West Virginia, Morgantown, W. Va., March 29-30, 1967.

Becker, William B.

Organized and arranged forest pest session at winter meetings of Northeastern Forest Pest Council, Boston, Mass., March 1967.

Member of committee that planned Annual Massachusetts Tree Wardens, Arborists and Utilities Conference, University of Massachusetts, Amherst, Mass., March 1967.

Becker, William B.

Presented paper, "Artificial Defoliation Tests With Sugar Maples, Annual Meeting of Eastern Branch of Entomological Society of America, New York City, October 1966.

Presented paper, "Effects of Bidrin on Elm Bark Beetles," Annual Massachusetts Conference on Dutch Elm Disease, Waltham, Mass., October 1966.

Holmes, Francis W.

Presented paper at American Phytopathological Society Meeting, Denver, Col., August 1966.

Represented Massachusetts at Heads-of-Departments Meeting, American Phytopathological Society, Denver, Col., 1966.

McKenzie, Malcolm A.

Leader of panel for discussion of gas injury, Northeastern Forest Pest Council, Boston, Mass., March 6, 1967.

Report sent to be read, based on research by Shade Tree Laboratories and "Conference Summary" in Proceedings, pp. 15-17, 21st Annual Conference on Dutch Elm Disease, Massachusetts Forest and Park Association, Waltham, Mass., October 5, 1966.

Norgren, Robert L.

Attended New England Fruit Spray Specialists' Conference, Stratton Mt., Vt., and spoke on "Fruit Disease Problems in Massachusetts and Their Current Control Practices."

Shaw, Frank R.

Presented Massachusetts reports on research on pesticide residues to NE-36 Technical Committee.

Presented Massachusetts reports on biology and control of alfalfa weevil at Third Invitational Alfalfa Weevil Conference, New Brunswick, N. J.

Wheeler, Ellsworth H.

Participated in Annual Meeting, Eastern Branch, Entomological Society of America, New York City.

Attended as committee member, national meeting of Eastern Branch, Entomological Society of America.

Speaker at Annual Meeting of Northeastern Mosquito Control Association.

ENVIRONMENTAL SCIENCES

Feder, William A.

Helped organize and participated in two meetings of Technical Committee of Northeast Regional Air Pollution Project NE-56, "Air Pollution Problems in the Northeast."

Hemerick, Glen

Submitted papers, "Nutritional Evaluation of Cyanophyto," and "Selection of Cyanophyto for Mass Culture," A.I.B.S., Special Session, Microbiology, College Station, Tex., August 1967.

Galinat, Walton C.

Presented four papers on corn research conducted during the past year, Annual Maize Genetics Conference, Allerton House, University of Illinois, Urbana, Ill., March 10-12, 1967.

Presented paper, "Plant Habit and the Adaptation of Corn," Annual Meeting of Society for Economic Botany, University of Miami, Coral Gables, Fla., June 5-8, 1967.

Litsky, Warren (with B. Y. Litsky)

Presented paper, "Investigations on the Decontamination of Hospital Surfaces by Disinfectants-Detergents," Annual Meeting of American Public Health Association, San Francisco, Calif., November 1966.

Presented three papers, "Attempts to Distinguish Toxigenic *Clostridium botulinum* Type E Employing Single Amino Acid Metabolism," "Determination of Carbohydrate Pathways for *Clostridium botulinum* Types A, B and E by Interval Radiorespirometric Techniques," and "Biosynthesis of Hemolysins by *Clostridium chauvoei*," Annual Meeting of American Society for Microbiology, New York City, May 1967.

Convener of round table, "The Hospital Environment and Infections," Annual Meeting of American Society for Microbiology, New York City, May 1967.

Invited participant to Western Hemisphere Conference on Importance and Safety of Foods, Mayaguez, Puerto Rico, April 1967.

Gunner, Haim B.

Presented paper, "Activation of Molecular Hydrogen by *Arthrobacter globiformis* 616," IX International Congress for Microbiology, Moscow, U.S.S.R., July 24-30, 1966.

Invited participant, First Research Conference on Ecology of Root-Infecting Microorganisms, University of Maryland, College Park, Md., April 3-4, 1967.

Gunner, Haim B.

Presented paper, "Microbial Association in Pesticide Degradation," Pesticides Session, Annual Meeting of American Society for Microbiology, New York City, April 30 - May 4, 1967.

Participant, project revision, Northeast Regional Research Project on Pesticides, NE-53, New York City, September 12-13, 1966.

Participant, NE-53 Technical Committee Annual Meeting, New York City, January 4, 1967.

Naegele, John A.

Presented two papers, Eastern Branch Entomological Society of America, Philadelphia, Penn.

Chairman of NE-56 - attended organization meetings of project and several subsequent meetings.

Invited participant, "Title I, HEW Symposium," Boston College, Boston, Mass., April 1967.

Invited participant, "The College, The Community, and Conservation," Conservation Foundation Symposium, Washington, D. C., May 1967.

Panel moderator, "Man and His Environment," Massachusetts Public Health Association Meeting, March 30, 1967.

Invited participant, "Megalopolis in New England," Boston College Symposium, Boston, Mass., February 21, 1967.

Invited participant, "Air Pollution," Winterfest Panel, Prudential Center, Boston, Mass., February 20, 1967.

Invited witness, Boston City Council Hearings on Air Pollution, May 1967.

Young, Robert E.

Presented two papers, Northeast Greenhouse Vegetable Conference, Rutgers University, New Brunswick, N. J., October 1966.

FOOD SCIENCE AND TECHNOLOGY

Cournoyer, Norman G.

Presented invited paper, "Menu Planning Using Linear Programming," U. S. Army Natick Laboratories sponsored by National Academy of Science.

Esselen, William B.

Presented technical papers at Food Microbiology Symposium, Northeast Section, Institute of Food Technologists; H. P. Hood & Sons Management Development Group Seminar, and Ninth Annual Seminar on Advanced Food Service Management, Boston University, Boston, Mass.

Evans, David A.

Presented technical papers at Conference on Interstate Milk Shipments, Miami, Fla., and at annual meeting of New England Milk Sanitation Rating Officers Conference.

Conducted in-service training session for regional agricultural Extension agents on recent changes in milk sanitation control, Amherst, Mass.

Francis, Frederick J.

Presented four technical papers at annual meeting, Institute of Food Technologists, Minneapolis, Minn.

Presented invited paper, "Colorimetry of Cocoa and Chocolate," Pennsylvania Confectionary Manufacturers Association, Lancaster, Pa.

Presented 10 lectures on "Food Colorimetry" to Regional Sections of Institute of Food Technologists as an IFT scientific lecturer.

Hayes, Kirby M.

Chairman, Fruits and Vegetable Research Section, Annual Meeting of Institute of Food Technologists, Minneapolis, Minn.

Presented technical paper at annual meeting of American Society of Agricultural Engineers.

Hultin, Herbert O.

Vice-Chairman of technical session, and presented two technical papers at annual meeting of Institute of Food Technologists, Minneapolis, Minn.

Lundberg, Donald E.

Lecturer for Club Managers Association Management Seminar at Vancouver, British Columbia, and Michigan State University, East Lansing, Mich.

Lecturer at Food Service Systems Seminar at Cornell University, Ithaca, New York, and Annual Food Seminar, University of Massachusetts, Amherst, Mass.

Nawar, Wassef W.

Presented technical papers at U. S. Atomic Energy Commission Contractors Meeting, Washington, D. C. and at American Oil Chemists Society Meeting, New Orleans, La.

Potter, Frank E.

Participated in annual meeting of New England group of National Ice Cream Retailers Association by serving as official judge at Ice Cream Clinic and moderator of a consumers' panel.

Sawyer, F. Miles

Presented technical paper at Annual Meeting of American Chemical Society, New York City.

Stumbo, Charles R.

Presented invited paper, "Fundamental Considerations in High-Temperature Short-Time Processing of Foods," Second International Congress on Food Science and Technology, Warsaw, Poland, August 1966.

Participated in Western Hemisphere Conference on "The Importance and Safety of Foods, Mayaguez, Puerto Rico.

Presented two technical papers at annual meeting of Institute of Food Technologists, Minneapolis, Minn.

FORESTRY AND WILDLIFE MANAGEMENT

Abbott, Herschel G.

Moderator of Special Session on Direct Seeding, meeting of New England Section, Society of American Foresters.

Presented paper, Joint Meeting of American Society of Agricultural Engineers and Canadian Society of Agricultural Engineers.

Bond, Robert S.

Program chairman, New England Section Annual Meeting, Society of American Foresters.

Chairman, Northeastern Forestry Economists Meeting, Harvard Forest.

Presented paper, Northeastern Loggers' Congress.

Carlozzi, Carl A.

Presented paper, Conference on National Parks in the Caribbean, Caribbean Research Institute.

Gatslick, Harold B.

Presented paper, National Meeting, Forest Products Research Society.

Greeley, Frederick

Presented paper, American Ornithologists Union Meeting.

Hoadley, R. Bruce

Session moderator, Northeast Section Meeting.

Mader, Donald L.

Presented paper, Soil Science Society of America.

Presented paper, Association of Southern Agricultural Workers' Meeting

Noyes, John H.

Presented paper, Symposium on Land Use and Development for Forestry and Agriculture, Commonwealth Forestry Institute, University of Oxford, England.

Scheffey, Andrew J. W.

Chairman, Technical Session on Farm and Urban Resources, North American Wildlife and Natural Resources Conference.

Invited participant, Conference on Recreation, Resources and Conservation, American Academy of Arts and Science.

Invited participant, Our People and Their Cities Conference, Urban America, Inc.

Wetherbee, David K.

Presented paper, Third Vertebrate Pest Control Conference.

LANDSCAPE ARCHITECTURE

Fabos, Julius Gy

Presented paper at 1966 N.C.I.L.A. Conference.

King, Gordon S.

Organized Annual Arborists and Tree Wardens Five-Day Conference.

Procopio, Paul N.

Presented paper at 1966 N.C.I.L.A. Conference.

Zube, Ervin H.

Developed program and presented paper at Annual Meeting of B.S.L.A.

PLANT AND SOIL SCIENCES

Bramlage, William J.
Maynard, Donald N.
Southwick, Franklin W.

Presented papers, XVII International Horticultural Congress, University of Maryland, College Park, Md., August 1966.

Colby, William G.

Presented paper, X International Grassland Congress, Helsinki, Finland, July 1966.

Presented papers, American Society of Agronomy Meetings, Oklahoma State University, Stillwater, Okla., August 1966.

Vengris, Jonas

Presented paper, Northeastern Weed Control Conference, January 1967.

VETERINARY AND ANIMAL SCIENCES

Currie, Gustavus N.

Presented paper, American Federation of American Societies for Experimental Biology, April 1967.

Dickinson, Frank N.

Presented paper, Animal Science Association, Rutgers University, New Brunswick, N. J., July-August 1966.

Presented two papers, American Dairy Science Association, Cornell University, Ithaca, N. Y., June 1967.

Fenner, Heinrich

Presented paper, International Symposium on Silage Preservation, Rostock, Germany, August 1966.

Fox, Thomas W.

Fellow recipient, National Science Foundation Summer Institute in Quantitative Genetics, Brown University, Providence, R. I., July 1966.

Gaunt, Stanley N.

Presented paper, 18th International Dairy Congress, Munich, Germany, July 1966.

Presented paper, American Dairy Science Association, June 1967.

Grover, Robert M.

Presented paper, Extension Section; served as Chairman, Extension Section, Poultry Science Association, Logan, Utah, August 1966.

Lyford, Sidney J., Jr.

Presented two papers, Dairy and Animal Science Association, Cornell University, Ithaca, N. Y., June 1967.

Mellen, William J.

Presented paper, Physiology Section; presented invitational report, CUEBS-CEANAR Biological Sciences Action Program, Poultry Science Association, Logan, Utah, August 1966.

Sevoian, Martin

Presented paper, American Veterinary Medical Association, Louisville, Ky., July 1966.

Presented paper, 13th World's Poultry Congress, Kieve, Russia, August 1966.

Presented paper, Northeastern Avian Disease Conference, Long Island, N. Y., June 1967.

Presented paper, International Symposium on Comparative Leukemias, Paris, France, July 1967.

Snoeyenbos, Glenn H.

Invitational discussant, U.S.P.H. Conference, Puerto Rico, April 1967.

FEED, FERTILIZER LAWS, SEED LABORATORY

Kuzmeski, John W.

Presented talk, "Salmonella in Feeds," New England Association of Food and Drug Officials, Woodstock, N. H.

Presented paper, "Cooperative Federal-State Inspections of Feed Mills," Southern New England Feed Control Officials Meeting, Federal Food and Drug Administration, University of Massachusetts, Amherst, Mass., September 1966.

Presented reports at meetings of Associations of American Feed and Fertilizer Control Officials in Chicago, Ill., and Minneapolis, Minn.

Discussed "Drug Assay in Feeds Methodology and the Establishment of Suitable Tolerances," Association of Official Analytical Chemists, Washington, D. C.

Lincoln, Waldo C.

Participated in referee test program of Association of Official Seed Analysts.

Rice, William N.

Represented Northeast Region in the Association of Official Seed Analysts referee tests, Wisconsin.

Participated in the Association of Official Seed Analysts referee testing program.

Participated in the Rules Committee of the Association of Official Seed Analysts work.

Smith, C. Tyson

Presented illustrated talk, "Pesticides in Feeds by Gas Chromatography, Association of American Feed Microscopists.

COLLEGE OF AGRICULTURE

1966-67

SECTION II -- INSTRUCTION

RESIDENT

NON-RESIDENT

COLLEGE OF AGRICULTURE

RESIDENT INSTRUCTION

1966-67

Highlights

Student Accomplishments and Recognition

HIGHLIGHTS

A proposal for the establishment of a Center for International Agricultural Studies has been prepared and approved in principle by the University Administration and the Board of Trustees. The proposal recommends an interdepartmental program at the undergraduate and graduate level utilizing resources of the entire University and Four College Community.

Agricultural and Food Economics

The department will offer a graduate program leading to the degree of Doctor of Philosophy in Agricultural Economics starting in the fall of 1967. The reactivation of this program which was dropped approximately 25 years ago will have a significant impact upon the growth and development of the department. Application has been made for a National Education Defense Act Fellowship to help support this program.

Faculty self-improvement continues with John H. Bragg receiving his Doctorate of Business Administration at Indiana University this past year, and N. Eugene Engel receiving his Doctor of Philosophy degree in Agricultural Economics at the University of Connecticut in June 1967. Donald R. Marion successfully completed his preliminary examinations in his Ph.D. program in the Department of Economics at the University of Massachusetts. Robert A. Fitzpatrick participated in the Symposium for Teachers of Agricultural Economics held at Virginia Polytechnic Institute in August.

The Stockbridge curriculum of the department has been analyzed, revised, and updated. Two courses were dropped, four courses were revised, and the four courses added. A new curriculum in Lumber and Building Materials Business Management will be in operation for the first time in the fall of 1967. This program was developed in conjunction with the Department of Forestry and Wildlife Management at the request of the Northeast Lumber Retailers Association. The Association is furnishing a scholarship to help students in the program.

The graduate program is currently under study. One new graduate course, Agricultural and Food Economics 721, Natural Resource Development Economics, was taught for the first time. In addition, the interdisciplinary course in which our department has been participating will be formalized into Planning 791, Regional Planning Studies to be taught in the fall of 1967.

Entomology and Plant Pathology

In spite of inadequate and antiquated classroom and laboratory facilities, enrollment in the department is at an all-time high. More than 1,100 Stockbridge, undergraduate and graduate students were enrolled in courses in 1966-67. The 28 departmental majors in the graduate school, 22 in entomology and six in plant pathology, likewise, exceeded all previous records.

Food Science and Technology

The department is one of the participants in a new interdisciplinary graduate program in Marine Science which is being established by the University.

The undergraduate programs have been strengthened and improved with the availability of new facilities. New recruiting materials are being prepared and it is hoped that these, plus the "Science In Action" program of the College of Agriculture and programs of the Institute of Food Technologists, will help to increase enrollment in Food Science and Technology. Enrollment in the Restaurant and Hotel Management Program continues to increase at a rapid rate.

Progress was made in the establishment of a two-year Associate Degree program in Restaurant and Hotel Management for the school lunch personnel of the State of Massachusetts. This program is established in cooperation with the State School Lunch Office under the direction of John Stalker. Course offerings were made at the Waltham Field Station and on campus. Two intensive summer session courses, one starting the last of June, are being offered on campus.

Forestry and Wildlife Management

Departmental programs, following approval last summer to offer graduate instruction leading to the Ph.D. degree, now include: a two-year major in Wood Utilization, and B.S., M.S., and Ph.D. programs in Forestry and Wood Technology, Wildlife and Fisheries Biology. During the second semester two Ph.D. candidates were enrolled, and six others will be in residence by September.

Expansion in enrollment continues. The number of departmental majors for all levels of instruction was 345 in 1966, and approximately 360 are anticipated for September 1967.

Landscape Architecture

A work study exchange between advanced students in architecture and landscape architecture of Hampton Institute, Hampton, Va., and the University proved to be a unique and rewarding venture. In November of 1966, 16 fifth-year students from Hampton Institute visited the department for a 10-day collaborative design problem. The educational and professional success of this first study exchange is the basis for a proposal to be submitted to the Office of Education requesting that the program be established on an annual basis, the two institutions alternating as host. The request for fund support is for an initial period of four years.

Academic 1966-67 was the third year of significant growth in the graduate program. The focus of instruction has been on environmental problems of the Pioneer Valley Region and in involving students on real problems with local leaders and decision-makers. Two examples of this kind of

course programming were:

A Study of the Memorial Industrial Park in Springfield.
The visual environment, land use controls and techniques for improving and altering them. The study was presented at a conference sponsored by the Joint Civic Agencies and the Junior Chamber of Commerce.

A Study of the Central Business District of Springfield.
The results of this study were published over a number of weeks in the Springfield newspapers.

Veterinary and Animal Sciences

The department has completed a successful year with increased student interest in our programs. At the mid-point of the academic year 62 undergraduate majors, 48 of them in the freshman and sophomore classes, were enrolled. The Stockbridge School two-year enrollment of 67 majors, 43 in the freshman class, exhibits the same trend.

The new program in Laboratory Animal Management as an option in our two-year Stockbridge program is off to a good start, and should provide an opportunity for many of the young women enrolled in Animal Science. Recent congressional action concerning the care of laboratory animals should provide many opportunities for graduates and create increased interest in the program.

Limitation of space and graduate faculty has required that only excellent young scholars be accepted to our graduate programs. The department qualified for an additional National Science Foundation Fellowship and one additional National Defense Education Act Fellowship. In addition, a successful application with chemistry and zoology to the National Institutes of Health for a Graduate Traineeship in Reproductive Physiology was completed. This grant will provide a total of $250,000 for a five-year period to support graduate education in the area of physiology of reproduction.

During the year a graduate program in Veterinary Microbiology was approved by the Trustees. This offering will round out our graduate program to include animal diseases.

COLLEGE OF AGRICULTURE

STUDENT ACCOMPLISHMENTS

AND RECOGNITION

AGRICULTURAL AND FOOD ECONOMICS

Steve Montgomery - Lear Award, Stockbridge Program, and Stop & Shop Award

Gerald Ahearn - Dean's List, Stockbridge Program

Phi Kappa Phi (Graduate Students) - Edward Krebs
Louis Klimoski
Neil Pelsue

(Undergraduates) - Yehoshua Tidhar
Leonard Shabman

Robert Mascioli - National Food Brokers Scholarship

Yehoshua Tidhar will graduate Summa Cum Laude and Leonard Shabman will graduate Cum Laude. Neil Pelsue is a recipient of a National Education Defense Act Fellowship to continue his education leading to a Ph.D. at Purdue University.

Edward Krebs is the recipient of a research assistantship to continue his education toward a Ph.D. at Michigan State University. Peter Ryan was a recipient of a research assistantship to continue his education toward a Ph.D. at North Carolina State University.

Stanley Kowalski received an assistantship in the Department of Economics, University of Massachusetts, to continue his program toward a Ph.D. degree. Alan Tsao received a research assistantship to continue his education toward a Ph.D. at Stanford University.

Yehoshua Tidhar has been granted a research assistantship to continue his program leading to a Master's degree at the University of Connecticut. Leonard Shabman was the recipient of a research assistantship to continue his program toward a Master's degree at Cornell University.

CRANBERRY STATION

One post-doctorate researcher received a grant to study at the Marine Biological Laboratory, Woods Hole, summer 1967.

One post-doctorate researcher and one Ph.D. candidate, upon completion of their degrees, secured positions at other universities.

ENTOMOLOGY AND PLANT PATHOLOGY

Election to Phi Kappa Phi, Spring 1967 - Frederick Holbrook, Ph.D., 1967
Boris Chevone, M.S. candidate
Duncan MacKenzie, M.S. 1967
Fred H. Nelson, M.S. 1967

Election to Sigma Xi - Frederick Holbrook, Ph.D., 1967, Fall Membership
Robert E. Grahame, Jr., M.S. 1967, Associate Membership
Mitchel C. Miller, M.S. 1967, Associate Membership

ENVIRONMENTAL SCIENCES

T. C. Boyd, a Ph.D. candidate, granted a U. S. Public Health Service Trainingship.

Sigma Xi (Graduate Students) - T. C. Boyd
Katherine S. Middleton
David Evans
John M. Trela

Phi Kappa Phi (Graduate Students) - Katherine S. Middleton
Joseph Koehane

The cooperative program with Thayer Academy (National Science Foundation sponsored) in summer research projects for advanced science students produced the following projects:

1965. Alfred deMaria, "Studies on Extracellular Metabolic Products of the Red Marine Alga, Porphyridium cruentum."

1966. Joseph Cecere, "Growth Kinetics and Photosynthesis Efficiency of Photosynthetic Bacteria, Rhodopseudomonas spheroides and Rhodospirillum rubrum."

Alfred deMaria received national award for research excellence in the National Talent Search for the Westinghouse Science Scholarships.

FOOD SCIENCE AND TECHNOLOGY

Two seniors in Food Science and Technology, Rodney J. Croteau and John Marletta, graduated Summa Cum Laude in June. They are two of a total of five such scholars in the University, Class of 1967. Both of them are enrolled for graduate work in the department. Mr. Croteau has been awarded a NASA Predoctoral Traineeship and Mr. Marletta a NDEA Predoctoral Fellowship.

In addition to the above, Mr. Croteau is a Phi Kappa Phi scholar of the Class of 1967. He did a Senior Honors project under the direction of Dr. Irving S. Fagerson for which he received the Sigma Xi Undergraduate Research Award. During the past year he received a $1,000 Institute of Food Technologists Undergraduate Award, a $300 Northeast Section IFT Undergraduate Award, the New York State Farmers Award to the top senior in the College of Agriculture, and a $1,000 Graduate Award for next year.

Among the outstanding students in Restaurant and Hotel Management were Carl Hawk, Editor of the Stockbridge School Yearbook, and Gerald Jolly, President of the STOSO organization.

Major students in the department were well represented in elections to honorary societies:

a. Phi Kappa Phi - 3 graduates, and 2 undergraduates, including a Phi Kappa Phi Scholar.

b. Sigma Xi - Full Membership - 6 graduates, and 1 faculty member. Associate Membership - 7 graduates, and 1 undergraduate.

c. Phi Tau Sigma - 10 graduates, and 2 undergraduates.

d. Alpha Zeta - 2 graduates.

Graduates in departmental majors:

Food Science and Technology	
B.S.	- 12
M.S.	- 5
Ph.D.	- 9
Associate Degrees	- 4 (Dairy Technology)

Restaurant and Hotel Management	
B.S.	- 11
Associate Degrees	- 31

FORESTRY AND WILDLIFE MANAGEMENT

Three seniors were enrolled in honors work during the year - two were graduated Magna Cum Laude, and three Cum Laude. Four graduate and two undergraduates were elected to Associate Membership in Sigma Xi; two graduate and two undergraduate students to Phi Kappa Phi; one freshman to Phi Eta Sigma; 19 undergraduates to Alpha Zeta; five undergraduate and seven graduate students to Xi Sigma Pi.

LANDSCAPE ARCHITECTURE

Recommendations for the improvement of the downtown business area of Gardner were made by four students in the department at a public presentation in that city on May 18. Charles Alexander and Robert Hull showed through charts, drawings, and pictures the improvements which could be made. Two other students, Randy Wright and John Alexopoulos, also participated in the presentation. The four students were among 14 seniors divided into three teams completing a study of the Gardner business area in order to determine what could be done to improve its over-all physical appearance. The study was part of an urban design sketch problem carried out by the students as part of their college course.

The team making the public presentation had studied the West Gardner Square area. Their recommendations included the elimination of on-street parking, removal of parking meters, correction of inefficient traffic circulation, widening of sidewalks, and the creation of strategically located malls. The Greater Gardner Chamber of Commerce presented the four students with a $100 check in appreciation of the work they had done.

VETERINARY AND ANIMAL SCIENCES

Cynthia S. Lloyd, Animal Science, Class of 1967

Phi Kappa Phi
Sigma Xi
Departmental Honors
Graduated Magna Cum Laude

William T. Cook, Animal Science, Class of 1967

Phi Kappa Phi
Departmental Honors
Graduated Magna Cum Laude

Margaret Sterni, Animal Science, Class of 1970

Received the Phi Tau Sigma $100 Essay Award

Linda Doggart

New York Farmers Award
Highest Academic Average, Sophomore Class, College of Agriculture

Ingrid Berg

New York Farmers Award
Highest Academic Average, Stockbridge Freshman Class

American Society of Animal Science Scholarship Awards

Students must rank scholastically among the top 10 per cent of their class in the College of Agriculture. In the 1966-67 academic year eight Animal Science students qualified as follows:

Seniors	Juniors	Sophomores
Cynthia S. Lloyd	David Almstrom	Linda Doggart
William T. Cook	Alan F. King	David J. Carlson
		Mary Hankins
		Henry M. Parsons

COLLEGE OF AGRICULTURE

NON-RESIDENT INSTRUCTION

1966-67

Highlights

Cooperative Extension Work

Program and Project Activities

Extension Advisory Council

Examples of Extension Programs

Division of Home Economics Extension

HIGHLIGHTS

Entomology and Plant Pathology

A highlight of the year was the translation of Dr. Frank R. Shaw's Extension Publication No. 148, BEEKEEPING, into French by the Agency for International Development for use in its program with underdeveloped countries.

Food Science and Technology

So successful was a workshop on "Convenience Foods and Their Use in Food Service Establishments" for the East coast salesmen of the Campbell Soup Company on May 28-June 1, the department was asked to repeat the program for Middle West convenience foods sales of the company in lieu of a similar program previously scheduled at Michigan State University. According to Campbell Soup management, the request and change from Michigan State was made because the program and facilities at the University were superior to previous workshops they had held at Michigan State. Thirty and 40 salesmen attended the first and repeat workshops (June 25-29), respectively.

Forestry and Wildlife Management

In recent years extension programs have dealt increasingly with the broad aspects of land use -- water, recreation, aesthetics -- and less with the production of timber as wood. This trend will continue in the future.

Dr. Andrew J. W. Scheffey's study of the Conservation Commission movement (it originated in Massachusetts 10 years ago and has spread to many other states) is nearly complete and will result in a book to be published next year by the Conservation Foundation.

4-H and Youth Programs

Land has been offered to the State 4-H Foundation for the establishment of a State 4-H Center. This property is in Ashland. Architects are currently developing construction plans and various Foundation committees have been formed to support the Center activities.

As a member of the Commonwealth Service Corps Advisory Committee, arrangements were made for Service Corps support of the 4-H program in Worcester County. There are five Corpsmen assigned to the Worcester County Extension Trustees for the purpose of expanding the 4-H program to low-income youth in Fitchburg, Worcester, Millbury, Clinton, and Athol. This relationship is being expanded into several other counties during 1967-68. -- Merle L. Howes

Directed three 4-H Television Series in cooperation with 10,513 public, parochial and private school teachers in 1,150 elementary and junior high schools in 295 communities throughout Massachusetts. These programs generated 285,427 requests for information about 4-H Club Work and enrolled 68,362 during the three 10-week series. Two of the series were 4-H TV Action Club telecasts dealing with natural disasters and emergency preparedness, which were aired separately on a Boston and New Bedford station. The third was a 4-H TV Science Club telecast dealing with 10 different science areas, which was aired over a Springfield station.

Norman Hall, Dalton, awarded a $500 4-H College Scholarship for outstanding achievement in 4-H Conservation Program. -- William W. Metcalfe

Supervised 14 University of Massachusetts students who are working as Professional Assistants under the summer work-study program. These students are organizing 4-H Clubs, recruiting volunteer leaders, and teaching leadership skills. They are working primarily in low-income neighborhoods.

Organized College of Agriculture resources and planned a "Science In Action" conference for secondary school science teachers and selected 11th grade science students at the University. The program gave participants an opportunity to learn concerns of the research scientist and then to see in the laboratories the research methods in use. Career opportunities in science were explored.

Organized and conducted a 4-H program in Roxbury. This program features community beautification programs. Involvement of people (young and old) has been the key to success. Some 300 youth and 25 adults are participating regularly with the program beginning to expand to other areas of Boston. Leadership for the program is coming from the neighborhoods.

Coordinated with Belchertown State School for retarded children and the Western Massachusetts 4-H staff the planning and development of a summer camp for retarded children. This camp was staffed primarily by 4-H volunteers. The camp offered rewarding experiences, both to the campers and the volunteer 4-H staff. -- Marvin W. Boss

Margaret Herrmann of Adams was the recipient of an $800 scholarship for her senior year in the School of Home Economics. This scholarship was given by Sperry and Hutchinson through the National 4-H Service Committee.

Roberta A. McCarthy of Warren was awarded a $1200 scholarship as a freshman in the School of Home Economics to begin September 1, given by the New England Farm and Garden Association. -- Mildred L. Howell

COOPERATIVE EXTENSION WORK

Cooperative Extension work is a voluntary out-of-school system of education for adults and young people in the fields of agriculture, home economics and related subjects.

The principle of applying knowledge for use is its philosophy.

Its method is to plan programs with its participants, basing these programs on current problems and needs and developing their substance from the relevant disciplines of the University.

Its objectives are --

to lessen the lag between discovery of knowledge and its useful application;

to gain a productivity response from the dissemination of knowledge;

to spur the development of the individual, the family, the farm, the firm, the group and the community.

In Massachusetts Cooperative Extension work is an arrangement entered into by the federal government through the United States Department of Agriculture; by the State through the University of Massachusetts; and by the counties through the trustees for County Aid to Agriculture in the counties of Barnstable, Berkshire, Dukes, Franklin, Hampden, Hampshire, Middlesex, Plymouth and Worcester and through the Trustees of the County Agricultural Schools in Bristol, Essex and Norfolk Counties.

D. P. Allan
3/1967

PROGRAM AND PROJECT ACTIVITIES IN COOPERATIVE EXTENSION

I. THE DEVELOPMENT OF HUMAN RESOURCES

Educational programs are conducted with families and members of families designed to improve social well-being and adjustment to social and economic changes. Opportunities for human development and improved human relationships within the family and within the community are emphasized.

Educational programs designed to foster beneficial physical, mental and emotional development of youth are conducted through a voluntary youth leader system. These programs offer a variety of learning and training situations providing youngsters opportunity for leadership development, career exploration, understanding the natural world of plants, animals, land, water, air and the opportunity to acquire knowledge and skills in agriculture and home economics.

II. THE IMPROVEMENT OF HUMAN NUTRITION AND CONSUMER SATISFACTION

Educational programs are conducted with families and with people as individual workers, as consumers, and as members of society on nutritional needs; on the selection, preservation, preparation and use of foods; on design, selection, construction, and care of clothing; on housing for the family; on equipment and furnishings for the household; and on the efficient and satisfying use and management of family resources.

III. EFFICIENT PRODUCTION AND QUALITY IMPROVEMENT OF FOOD AND OTHER AGRICULTURAL PRODUCTS

Educational programs concerned with the biology of plants and animals, improvement of the biological efficiency of plants and animals, increased consumer acceptability of farm and forest products, the mechanization and improvement of physical efficiency and the management of labor, capital, and other inputs to maximize income are conducted with producers, agricultural supply firms, related federal and state agencies, and agricultural organizations.

IV. NEW AND IMPROVED DEVELOPMENT AND PROCESSING OF FOOD AND OTHER AGRICULTURAL PRODUCTS

Educational programs pertaining to the chemical and physical properties of food and other agricultural products and programs concerned with developing new and improved food and non-food products and processes are conducted with processing firms, manufacturers and processing supply firms, institutional consumers of food and non-food agricultural products, and related federal and state agencies.

V. EFFICIENT MARKETING, INCLUDING PRICING AND QUALITY OF FOOD AND OTHER AGRICULTURAL PRODUCTS

Educational programs are conducted with distributors of food and other agricultural products, food service operators, the related supply firms, federal and state regulatory agencies on subjects concerned with identification, measurement and maintenance of quality; improvement of economic and physical efficiency; analysis of supply, demand and price, including interregional competition; and the development of markets, including consumer preference and behavior.

VI. CONSERVATION, DEVELOPMENT, AND USE OF SOIL, WATER, FOREST AND RELATED RESOURCES, AND THE DEVELOPMENT OF ECONOMIES OF COMMUNITIES AND AREAS

Educational programs of resource description, inventory, conservation, development, management and evaluation of alternative uses and methods of use are conducted with farmers, land owners, conservation commissions, development commissions and many other regional and inter-community groups.

Local factual information including description, inventory and trends is compiled and disseminated to aid in community, county and area economic development and adjustment.

VII. PROTECTION OF MAN, PLANTS AND ANIMALS FROM LOSS, DAMAGE OR DISCOMFORT CAUSED BY INSECTS, DISEASES, PARASITES, WEEDS, FIRE, AND OTHER HAZARDS

Educational programs related to the protection of people; to the preservation and protection of man-made resources, crops and crop products, animals and animal products, and forest and related resources are conducted with producers and consumers of these products and resources.

D. P. Allan
3/1967

MASSACHUSETTS COOPERATIVE EXTENSION

ADVISORY COUNCIL

April 1967

The Massachusetts Cooperative Extension Advisory Council was formed in the late 1950's to provide a means of bringing together local leaders, county trustees and commissioners, and University Extension administrators. The Council provides a forum for informative and exploratory discussions on problems and situations of mutual interest. While the Council is advisory only, it effectively provides the foundation for the development and implementation of Extension policy. The membership of the Council is as follows:

Mr. Tony Andrews, 398 Old Meeting House Road, East Falmouth, Mass. 02536
Member of State Board of Agriculture, SCS District Officer, Strawberry Grower

Mr. George Aro, Aro's Poultry Farm, Inc., 27 Elm Street, West Townsend, Mass. 01474
Poultry and Egg Producer, Hatcheryman, Cooperative Leader, County Trustee

Mr. Nathan Chandler, Sterling Junction, Mass. 01565
Fruit Grower, Massachusetts 4-H Foundation, Massachusetts Society for Promoting Agriculture

Mr. Jonathan Davis, Redstone Hill, Sterling Junction, Mass. 01565
Farmer, Dairyman, Fruit Grower, President of AGWAY, Inc.

Mr. Raymond DeVincent, 172 Lyman Street, Waltham, Mass. 02154
Vegetable Grower, Former President of New England Vegetable Growers' Association, County Trustee

Mr. S. S. Garjian, S. S. Garjian Poultry Farm, 1634 Turnpike Street, Stoughton, Mass. 02072
Poultryman, President of Massachusetts Farm Bureau Federation

Mr. Philip N. Good, Massachusetts Farm Bureau Federation, 155 Lexington Street, Waltham, Mass. 02154
Executive Secretary of Massachusetts Farm Bureau Federation

Mr. Arthur M. Howard, 188 Hubbard Street, Lenox, Mass.01240
Selectman, Local Leader, County Trustee

Mr. Lorenzo D. Lambson, 36 Loomis Street, Southwick, Mass. 01077
Tobacco Grower, University of Massachusetts Trustee

Mr. Linwood B. Lesure, Watson Road, Ashfield, Mass. 01330
Maple Syrup Producer, Secretary of State Conservation Committee, Leader in Maple Syrup Cooperative

Mr. Walter F. Lewis, 172 Robin Hill Road, Chelmsford, Mass. 01824
Dairyman, Livestock Marketing, Director of Massachusetts Farm Bureau Federation

Mr. Myron A. Maiewski, South Deerfield, Mass. 01373
Potato Grower, Assistant Commissioner of Agriculture

Mr. David B. Mann, Head of Bay Road, R.F.D. #3, Buzzards Bay, Mass. 02532
Cranberry Grower, Director of Massachusetts Farm Bureau Federation

Mrs. Everett L. Martin, Sr., North Street, Cheshire, Mass. 01225
Committee Chairman of Massachusetts Homemakers' Council

Mr. Charles H. McNamara, Massachusetts Department of Agriculture, 100 Cambridge Street, Boston, Mass. 02202
Commissioner of Agriculture, Dairyman

Mr. Earle P. Parsons, 143 Mill Valley Road, Hadley, Mass. 01035
Potato and Tobacco Grower, Member of State Board of Agriculture, County Trustee

Mr. John F. Prentice, Jordan Road, Plymouth, Mass. 02360
Dairyman, Member of State Board of Agriculture

Mr. William C. Richards, Veg-Acre Farms, Forestdale, Mass. 02644
Vegetable Grower, President of New England Vegetable Growers' Association

Mrs. Raymond Smith, 15 Melcher Street, Plainville, Mass. 02762
Committee Chairman of Massachusetts Homemakers' Council

Mr. Leon V. St. Pierre, 51 Fenwood Road, Longmeadow, Mass. 01106
President of Golf Course Superintendents' Association of New England (Massachusetts)

Mr. William F. Stapleton, 56 Suffolk Street, Holyoke, Mass. 01040
County Commissioner, County Trustee

Mr. Jules P. Sussman, 15 Holmes Road, Lexington, Mass. 02173
President of Massachusetts Association of Conservation Commissions

Mr. Christopher B. Sykes, Willard Road, Ashburnham, Mass. 01430
Dairyman, Leader in Milk Marketing Cooperatives

Mr. Frank Tyrell, 2 Meadow Lane, Danvers, Mass. 01923
Chairman of State Conservation Committee, Massachusetts State Grange

Mr. William C. Wright, Grove Street, Norfolk, Mass. 02056
Member of Norfolk Conservation District

Mr. H. Heyworth Backus, Wequaquet Lake, Box 651, Centerville, Mass. 02632
Chairman, Barnstable County Extension Trustees

Mr. Shirley E. Gardner, Mount Hope Farm, Williamstown, Mass. 01267
Chairman, Berkshire County Extension Trustees

Mr. Clinton W. Lush, 299 Fall River Avenue, Seekonk, Mass. 02771
Chairman, Bristol County Extension Trustees

Miss Anna L. Oliver, P. O. Box 1551, Oak Bluffs, Mass. 02557
Chairman, Dukes County Extension Trustees

Mr. Donald R. Driscoll, 30 Stover Lane, Haverhill, Mass. 01830
Chairman, Essex County Extension Trustees

Mr. Charles Llewelyn, Upper Farms, Northfield, Mass. 01360
Chairman, Franklin County Extension Trustees

Mr. George S. Gay, Three Rivers, Mass. 01080 (Baptist Hill Road, Palmer 01669)
Chairman, Hampden County Extension Trustees

Mrs. Edward L. Ezold, 3 Burnett Avenue, South Hadley, Mass. 01075
Chairman, Hampshire County Extension Trustees

Mr. Ben W. Drew, Main Street, Westford, Mass. 01886
Chairman, Middlesex County Extension Trustees

Mr. Richard J. Koch, 241 Newbury Avenue, Quincy, Mass. 02171
Chairman, Norfolk County Extension Trustees

Mr. Gilbert Blackledge, 76 Park Avenue, Whitman, Mass. 02382
Chairman, Plymouth County Extension Trustees

Mr. Shelley D. Vincent, Main Street, Mendon, Mass. 01756
Chairman, Worcester County Extension Trustees

AAS:MRE
3/31/67

EXAMPLES OF EXTENSION PROGRAMS

CARRIED BY

THE FACULTIES OF THE DEPARTMENTS

OF THE

COLLEGE OF AGRICULTURE

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DEPARTMENT OF AGRICULTURAL AND FOOD ECONOMICS

SALES FORECASTING STUDY--FOOD DISTRIBUTION

This was one of several studies that have been conducted in cooperation with food distribution firms in order to identify and solve problems associated with the handling and distribution of food products.

Purpose - To develop and test a mathematical model for predicting retail food sales and identifying the important determinants of short-run sales variations.

Method - Data were obtained in cooperation with a local retail food chain and analyzed by means of appropriate statistical techniques.

Results and Application - The model explained eighty per cent of the monthly sales variations for the test firm and identified the most significant factors associated with changes in sales. The model enabled the prediction of sales with a greater degree of accuracy than the estimates made by the cooperating firm's management. A highly predictable seasonal sales pattern was also identified.

The results of the study will enable food distribution firms to utilize resources more efficiently.

Dissemination - The results were disseminated to all major retail food firms in Massachusetts by means of a publication. Requests for the publication have been received from many other states and several foreign countries.

The results will also be utilized in future Food Distribution seminars and in individual consultation with firms.

Faculty - Dr. Theodore W. Leed, Professor of Food Marketing
Howard C. Jensen, Former Graduate Assistant in Agricultural & Food Economics
Dr. Sidney Schoeffler, Professor of Economics
Dr. Gail Oakland, Professor of Statistics
Dr. David A. Storey, Associate Professor

Cooperating Firm - Food Marts, Inc., Holyoke, Massachusetts

FOOD DISTRIBUTION SEMINARS

Conducted by the Department of Agricultural and Food Economics in cooperation with the Departments of Food Science and Technology, Agricultural Engineering, Veterinary and Animal Sciences; the School of Home Economics and supported by staff members from other schools and departments.

The seminars are held for one and one-half or two days for technical and managerial personnel associated with food wholesaling and retailing firms. Representatives from supply and equipment manufacturing firms and management consulting firms are sometimes invited to participate.

Purpose - To improve the efficiency of food distribution by providing technical and economic knowledge to those who can apply it in the management of firms that handle and distribute food products.

Content - (A) Technical aspects of handling, storing, packaging and displaying food products so as to maintain quality, control costs, reduce spoilage and maximize consumer satisfaction. Includes physiological characteristics of fresh and processed foods, packaging methods and materials and materials handling methods and equipment. For food buyers, merchandisers and technicians.

- (B) Improved management practices for middle and top management personnel. Includes methods for forecasting sales, determining and using information on consumer attitudes and behavior, scheduling labor, budgeting and controlling sales and expenses, training and supervising personnel and other aspects of managing food distribution firms. The results of studies conducted in cooperation with food distribution firms are used extensively in the seminars.

The latest in this series of seminars was intended to assist management personnel in retail food distribution firms to schedule, train and supervise personnel in order to achieve desired results at the lowest possible cost. A computer simulation game and the results of studies conducted in cooperation with food retailing firms were used in the seminar. Details of the seminar are listed below.

Faculty - Dr. Theodore W. Leed, Professor of Food Marketing
Donald R. Marion, Assistant Professor, Food Marketing
Ben B. Seligman, Director, Labor Relations and Research Center
A. Thomas Mason, Graduate Assistant, Industrial Engineering

Guest Lecturers - Dr. J. Clayton Lafferty, University of Michigan and Partner in Firm of Adams, Lafferty, Modden and Moody, Detroit, Michigan
Kenneth G. Abrahams, Vice President, Food Marts, Inc., Holyoke, Mass.
Milton W. Segel, Vice President, Viking Division, Elm Farm Foods Company, Boston, Massachusetts

Dates Held - October 11 and 12, 1965

Attendance - 50

MANAGEMENT SCHOOLS FOR AGRICULTURAL PRODUCERS

An educational program consisting of four-day or six-day schools open to farmers by specialized commodities and by invitation. Enrollment is limited to commercial farms and groups of not more than twenty-five in any one series.

Program Content

(A) Economic Climate (What is the economic setting of modern agriculture?)

(B) Farm Management Principles
- Law of Diminishing Returns
- Determining Maximum Profit Point
- Substitution Problems
- Fixed and Variable Costs

(C) Management Techniques (How problems arise and how to identify them)
- Role of Beliefs, Values and Goals
- Problem Identification

(C) Management Techniques (Continued)
Developing Problem Solutions
Testing Solutions
Budgets, Forward Accounting, and Linear Programming
Application of Solutions
Evaluation

Individual farm problems from the groups are used. In the case of dairymen, four day of classroom discussion are followed by "farm walks." Each farmer visits his own farm and three other farms as a "laboratory technique." Four such schools are planned for 1966-67. The program as such is concerned with methods which managers can use to solve problems and improve decision making.

Problems include:
Choice of farm machines
Choices of farm output
Problems of reducing farm costs
Problems of farm organization, size, and supplemental enterprises
Problems of substitute feed usage, forage production, farm buildings, and financing charges

Faculty - Lawrence D. Rhoades, Associate Professor
Earl I. Fuller, Associate Professor

PLANNING OF REPRESENTATIVE FARMS

A case example of the kind of planning and analysis is given below for one farm.

The farm is a dairy farm producing wholesale milk.

1962. The owner attended a Farm Management off-campus school.

1963. Requested assistance in planning for a larger farm business and income.

A budget estimate of income and expense was prepared to test the profitability of a move to a larger herd and the addition of substantial capital in the form of new housing, additional cows and a revised kind of farm equipment.

The following table indicates the actual farm income and expense for the period as compared to the budget.

	1963	1964	1965	1966	Budget
Gross income	$38,300	$36,274	$50,002	$62,500	$63,000
Expense	28,572	27,785	41,138	41,100	38,000
Margin for return on investment and management	$ 9,728	$ 8,489	$ 8,864	$21,400	$25,000
Herd size	53	50	62	75	75

Capital added
$44,000

The manager has taken three years to make the increase in size and to gain the efficiencies and realize the economies of size and scale on this farm now in the hands of the third generation to farm on this farm. The results of the changes made were predicted in 1963 by the use of forward accounting or budgeting. Production has doubled on the farm over this period with a reduction of the labor force.

Faculty - Earl I. Fuller, Associate Professor
Lawrence D. Rhoades, Associate Professor

SUPERVISORY MANAGEMENT TRAINING PROGRAM

Conducted by the Department of Agricultural and Food Economics, this program consists of a series of three-day institutes. Each year, one additional institute is added to the program. In 1967, three institutes were held. Four have been scheduled for 1968.

Purpose - Each institute is a complete unit and deals with a specific phase of supervisory management. The overall purpose of the program is to upgrade the quality of the performance of the first line of management in agriculturally-oriented firms. Participation is restricted to supervisors, middle-managers and those employees with management potential.

Content - Institute I - This three-day institute is designed to assist the participan (1) in relating his job to the needs of the company and (2) in improving his ability to present ideas clearly and convincingly. Among the specific subjects taught are:

The Supervisor's Role in Company Management
Skills Required of Managers
Dealing with Critical Incidents in Supervision
Understanding the Causes of Faulty Communication
Getting the Job Done Through Effective Use of Company Policy
The Fundamentals of Plain Talk
How to Get Ready to Talk
Maximizing Speech Clarity and Minimizing Confusion

Content - Institute II - This three-day institute is designed to assist the participa (1) in understanding the fundamentals and benefits of sound organizational practices and (2) in improving his ability to understand through the development of good listening habit Among the specific subjects taught are:

The Supervisor's Role in Company Organization
How to Use Organization Tools Effectively
Matching Job Applicant Skills to Job Requirements
Effective Interview Techniques
The Importance of Performance Standards
Evaluating Employee Performance
Hearing and Understanding What is Said
Techniques of Listening
Improving Face-to-Face Communication

Content - Institute III - This three-day institute (1) emphasizes the importance of understanding the individual as a basis of motivation and (2) to assist the participant in improving his ability to train subordinates effectively. Among the specific subjects taught are:

What Management and Employees Expect of Each Other
How Frame of Reference Affects Behavior
Understanding Individual and Group Behavior
Handling Employee Grievances
Training That Corrects Mistakes
Dynamic Supervisory Leadership
Analyzing Training Needs
How People Learn
Job Instructor Training
Evaluating Training Results

Faculty - John H. Bragg, Associate Professor

Guest Lecturers - Paul M. Stokes, Executive Vice President, Nelson, Nicol and Stokes

Dates Held and Attendance:

Institute I - January 5, 6, and 7, 1967 -- Attendance - 32
Institute II - January 9, 10, and 11, 1967 -- Attendance - 22
Institute III - January 11, 12, and 13, 1967 -- Attendance - 22

FARMER-COOPERATIVE DIRECTORS' WORKSHOP

Conducted by the Department of Agricultural and Food Economics in cooperation with the Springfield Bank for Cooperatives, this three-day workshop is offered to directors of Farmer-Cooperatives in the Northeast. One such workshop is scheduled and others in different locations and on different topics are planned.

Purpose - to assist the participating director in identifying his responsibilities to the cooperative. To teach the fundamentals and benefits of sound financial planning and control for cooperatives.

Content - During the three days, the following subjects will be taught through the use of lectures, small group discussions, cases, and problems.

Defining the Board Member's Job
Skills Needed by the Board-Member
Board-Management Relationships
The Role of the Board in Policy Formulation
Financial Planning Fundamentals
Financial Policy Formulation
Controlling Operations
Analysis and Interpretation of Financial Statements

Faculty - John H. Bragg, Associate Professor

Guest Lecturers - Richard A.Neis, Chief Loan Officer, Springfield Bank for Cooperatives
Howell Hughes, Vice President, Springfield Bank for Cooperatives
Edward Gelsthorpe, Executive Vice President, Ocean Spray Cranberries, Inc.

Dates - February 15, 16, 17, 1967

Attendance - 23 participants are registered

DEPARTMENT OF AGRICULTURAL ENGINEERING

POWER EQUIPMENT SEMINAR

Co-sponsor - the New England Farm and Power Equipment Dealer's Association.

This series of seminars has been directed toward the equipment dealers in New England as a one day semi-technical program in which various themes are pursued. Latest developments in agriculture pertinent to the dealers are explored in depth by a speaker program with ample period for discussion. Other agricultural leaders such as agricultural teachers, county agricultural agents are invited to participate.

Purpose - To provide an objective semi-technical presentation to dealers in New England which will assist in coordinating the dissemination of technical data by this group and our agricultural engineering staff. To increase the support and interchange of ideas toward better service to the agricultural community.

Content - An example of a typical seminar program (this one presented in November 1965) is as follows: Fertilizer Handling - Liquid vs. Granular, Fluid Manure Handling, Forage Systems Analysis, Personnel Training in a 2-Year Program, Profit Sharing, The Effect of Federal Programs on Dealer-Personnel Relationships, Dual Dealerships - Pros and Cons.

Faculty - Dr. Lester F. Whitney, Associate Professor
Robert G. Light, Associate Professor
Dr. Martin E. Weeks, Professor, Plant and Soil Sciences

Guest Lecturers - Burton S. Horne, Agricultural Engineer, Pennsylvania State Universit
Connor Stephens, Associate Professor, Agricultural Engineering Technology Division, Agricultural & Technical Institute, Alfred, N.
Raymond Allain, Accountant, E. K. Willard, Inc., Leominster, Mass.
Edward Jones, Assistant Vice President, Joint Civic Agencies of Greater Springfield, Inc., Springfield, Massachusetts

MASTITIS PREVENTION AND CONTROL

Cooperating department - Veterinary and Animal Sciences.

Mastitis prevention workshops have been presented for farmers and for veterinarians. Farmers, equipment dealers, county agents are invited to participate in the first type meeting. Veterinarians, who may become more helpful on the control of Mastitis, are expected to attend the second.

Purpose - To develop an awareness of the inter-relationships--man - animal - and equipment for milking--which may be contributory to the disease Mastitis; the physiology of the udder, how equipment can be tested to determine whether it is functioning properly and whether milking technique is the requirement which will aid in prevention of the disease.

Content - (a) For Farmers: A 4-day workshop, 2 hours on each of 4 days within a 2-week period. The typical program was:

Anatomy and Physiology of the Udder
Milk Composition
Milking Equipment Principles

Operation in Barn
Milking Equipment Testing
Demonstration in Barn
Equipment Sanitation

(b) For Veterinarians: Similar in content to the above but given in a 2-day program by Dr. Stern and C. A. Johnson.

Faculty - Douglas N. Stern, Professor, Veterinary and Animal Sciences
Stanley N. Gaunt, Professor, Veterinary and Animal Sciences
David A. Evans, Assistant Professor, Food Science and Technology
Curtis A. Johnson, Associate Professor
Bernard L. Hilton, Farm Superintendent, Veterinary and Animal Sciences

Guest Lecturers - Michael Kosciusko, DeLaval Separator Company, Poughkeepsie, New Yo

FARM STRUCTURES SEMINAR

Conducted by the Agricultural Engineering Department, this seminar is presented annually as a one-day seminar at Amherst. Farm building contractors, retail lumber suppliers, farmstead equipment and structures dealers, leading farmers and county agents are invited to participate.

Purpose - To develop awareness among participants of new developments in the general farm structures field; and to increase their level of technical knowledge within specific, continuing problem areas.

Content - Selected topics of current value relating to materials use; structural design; physical plant layout; and environmental control in potato, apple, vegetable and roo stock storages; greenhouses; livestock and poultry production systems; and recreational facilities.

Faculty - Robert G. Light, Associate Professor
William H. Collins, Assistant Professor
Curtis A. Johnson, Associate Professor
Joe T. Clayton, Head of Department

Guest Lecturers - Selected annually by demonstrated competence to suit a program them from industry, trade associations, and other educational institutions.

Dates Held - Annually, during April.

Attendance - 50-70 anticipated.

DAIRY SYSTEMS ENGINEERING PROGRAM

Conducted by the Agricultural Engineering Department cooperatively through the Extens Dairy Committee.

This program is a continuing engineering education program developed for and directe to the dairy farmers of the state.

Purpose - To present technical engineering subject matter such as physical plant layout and development; environmental control; and structural design to dairymen; to inform them of new developments; and to increase their level of awareness and understanding of engineering subjects as they relate to business decisions on housing construction; mechanization; materials handling; control of plant and animal environment; materials use; and compliance with applicable sanitary codes.

Content - Engineering information on dairy housing system layout; fluid manure storage and handling; forage harvesting, handling and storage; environmental control; general construction and implications of sanitary codes on construction are regularly presented throug monthly articles in the Dairy Digest; Dairy Farmers' Seminar; subject matter meetings; and in special schools such as the Dairy Herd Management School and Corn Schools. In-service training seminars for county extension personnel cover similar materials in greater depth to educate the local staff on engineering subjects; a special two-day training seminar is held annually for extension agents on dairy cattle housing.

Faculty - Robert G. Light, Associate Professor

POULTRY SYSTEMS ENGINEERING

Conducted by the Agricultural Engineering Department in cooperation with the Department of Veterinary and Animal Sciences.

Meetings, demonstrations, field research, prepared materials, and individual consultations are used continuously throughout the year. Pertinent engineering information is developed and transmitted to poultrymen, regional extension specialists, commercial representatives, and others associated with the Massachusetts poultry industry.

Purpose - To provide a continuing education program dealing with engineering problems in poultry production with the objective of improving the economic position of the Massachusetts industry.

Content - Development and presentation of engineering information relative to systems planning, production environment, buildings construction, utilities, etc. Engineering recommendations are transmitted through meeting presentations, demonstration production units, prepared materials (articles and plans), and by educational conferences with regiona extension specialists dealing with poultry.

Faculty - William H. Collins, Assistant Professor, and staff.

CRANBERRY STATION

CRANBERRY SEMINARS

Seven weekly seminars for all cranberry growers, foremen and members of the work force Usually scheduled for two hours each but with latitude for longer discussion and question periods if necessary.

Purpose - To provide the cranberry industry with an informative compilation of all available information on various cultural practices.

Content - Flood management, frost protection, insect control, irrigation, use of low gallonage sprinkler systems, weed control, fertilizer usage and new varieties. These seminars were later printed as a bulletin and distributed to growers.

Faculty - Chester E. Cross, Head of Department
William E. Tomlinson, Jr., Professor
John S. Norton, Associate Professor
Bert M. Zuckerman, Professor
George B. Rounsville, Assistant to Farm Superintendent
Irving E. Demoranville, Assistant Professor

Dates Held - January 20, 27; February 3, 10, 24; March 3, 10, 1965.

Attendance - 885 total.

CRANBERRY CLUB MEETINGS

Planned and conducted by the Cranberry Experiment Station in cooperation with the Cap Cod, Southeastern and Southshore Cranberry Clubs.

Six area meetings held in February and March for cranberry growers and key personnel.

Purpose - To provide results of current research and observations, as well as guest lecturers on subjects in which growers have indicated an interest.

Content - Bulk handling equipment, water harvesting, sales tax, sources of credit, insect and weed control, pesticide residues, fungicides tests, and production prospects.

Faculty - Chester E. Cross, Head of Department
William E. Tomlinson, Jr., Professor
John S. Norton, Associate Professor
C. Wesley Miller, Assistant Professor
Robert M. Devlin, Assistant Professor
Bert M. Zuckerman, Professor
Irving E. Demoranville, Assistant Professor

Guest Lecturers - Philip N. Good, Executive Secretary, Massachusetts Farm Bureau
Charles C. Starr, Farmers Home Administration
Warren Arnold, Production Credit Association
Allison Cook, National Bank of Wareham
John MacDonald, American Plywood Association

Dates Held - February 15, 16, 17; March 15, 16, 17, 1966.

Dates to be Held - February 14, 15, 16; March 14, 15, 16, 1967

Attendance - 340 total in 1966.

AREA CLINICS

Conducted by the Cranberry Experiment Station.

Spring and summer clinics for cranberry growers and key personnel. Usually schedule for two hours with extra time for discussion and questions, and observations of demonstrations.

Purpose - To appraise the various seasonal changes in cultural practices and assist growers in their decisions as to which practice is best for maximum yields.

Content - Spring clinics - spring insect and weed control, frost protection, keeping quality. Summer clinics - summer insect and weed control, irrigation, pesticide applications by sprinkler, weather conditions.

Faculty - Chester E. Cross, Head of Department
William E. Tomlinson, Jr., Professor
John S. Norton, Associate Professor
Irving E. Demoranville, Assistant Professor

Dates Held - May 24, July 6, 1966.

Attendance - 185 total.

FROST WARNING SERVICE

Conducted by the Cranberry Experiment Station and Cape Cod Cranberry Growers Association in cooperation with the United States Weather Bureau.

In operation each afternoon and evening during the spring and fall frost seasons.

Purpose - To assess atmospheric weather conditions and vegetative conditions on the cranberry bogs in order to appraise the growers of the possibility of damaging frosts (frost warnings).

Content - To compute the probable minimum cranberry bog temperatures on a given night, using temperature and dew point data from East Wareham, Worcester, Rockport and Boston. These data are used in various formulae worked out at the Cranberry Station many years ago. Wind speed and direction as well as cloud covers at various weather stations are also considered before a decision is made as to whether or not a frost will occur.

Faculty - George B. Rounsville, Assistant to Farm Superintendent
Kenneth J. Rochefort, Laboratory Assistant

Dates Held - Each afternoon and evening, April 20 through June 10, and September 1 through November 1.

Attendance - There are approximately 240 subscribers, who defray the telephone and observer costs. Five radio stations carry the frost warnings as a public service.

DEPARTMENT OF ENTOMOLOGY AND PLANT PATHOLOGY

VEGETABLE CROP PROTECTION SHORT COURSE

Cooperating department - Plant and Soil Sciences.

This course was presented as a three-day workshop to give vegetable growers an opportunity to learn more about pesticides, how and when to use them to protect crops from insects, nematodes, diseases and weeds; how they work and their comparative costs.

Purpose - To improve and enhance grower understanding of pesticides, their uses, and costs. To aid growers in basic understanding of control procedures and problems.

Content - Pesticides, their properties, how they work, when to apply them and application equipment.

Faculty - Herbert E. Wave, Assistant Professor
Robert L. Norgren, Assistant Professor
Cecil L. Thomson, Professor, Plant and Soil Sciences
Richard A. Rohde, Associate Professor
Ellsworth H. Wheeler, Professor

Guest Lecturer - Dr. James L. Brann, Entomology Department, Cornell University.

Attendance - 120.

CONFERENCE ON MOSQUITO SUPPRESSION AND WILDLIFE MANAGEMENT

Arranged through the leadership of the Pesticide Chemicals Educational and Extension Entomology programs of the Department of Entomology and Plant Pathology. Co-sponsored by Federal and State agencies and private organizations interested in mosquito, wildlife and conservation.

A two-day conference, followed by a one-day field trip, open to anyone working or interested in the areas of mosquito and "greenhead fly" control, fish and other wildlife management and in the conservation of natural resources.

Purpose - To stimulate interest in a coordinated approach to wildlife management and pest insect suppression through a better understanding of technical problems and improved communications.

Content - Public interests in mosquito control and wildlife resources from the standpoints of health, economics, recreation and aesthetics; fish and wildlife problems encountered in mosquito control, including possible effects of source reduction, pesticide use and new approaches to control; mosquito and other pest problems affected by wildlife management practices in coastal and inland waters; coordination of efforts for the greatest benefit of all interests has been successful in other areas; it should be possible here in the northeast; field trip to problem areas and examples of control and management practices.

Faculty - Ellsworth H. Wheeler, Professor

Guest Lecturers - Dr. K. D. Quarterman, Deputy Chief *Aedes aegypti* Eradication Branch Public Health Service
Dr. John R. Bagby, Communicable Disease Center, Public Health Servi
Daniel M. Jobbins, The State University, New Jersey
Roland C. Clement, National Audubon Society
Ralph A. Schmidt, Bureau of Sport Fisheries
LeRoy Kinsey, Mosquito Control Division, Nassau County, N. Y.
Dr. Herbert F. Schoof, Assistant Chief, Biology/Chemistry Section, Public Health Service, Savannah, Georgia
Dr. Carroll N. Smith, Insects Affecting Man and Animals Laboratory, United States Department of Agriculture
Robert L. Armstrong, East Middlesex Mosquito Control Project

Dr. Donald L. Collins, New York State Entomologist
Dr. George S. Langford, State Entomologist, University of Maryland
C. E. Addy, Migratory Bird Population Station, Bureau of Sport Fisheries and Wildlife
William H. Stickel, Patuxent Wildlife Research Center, Bureau of Sport Fisheries and Wildlife
William Tompkins, Chief Aquatic Biologist, Massachusetts Division of Fisheries and Game
E. A. Seaman, Advisor on Natural Resources, U. S. Air Force
W. M. Upholt, Federal Committee on Pest Control
Don M. Rees, University of Utah
Frederick Deiler, Chairman, Northern Gulf Coordinating Council on Wildlife Management and Mosquito Control
T. Wayne Miller, Jr., Lee County Mosquito Control District, Fort Meyers, Florida

Dates Held - April 20-22, 1966, at the Holiday Inn, Newton, Massachusetts

Attendance - 119.

PESTICIDE CHEMICALS PROGRAM AND INFORMATION CENTER

Organized and conducted under the leadership of the Department of Entomology and Plant Pathology assisted by faculty of other departments having responsibilities for pesticide education and pest control recommendations.

Articles are prepared, TV and radio tapes are utilized, talks are presented, discussions and demonstrations are held continuously throughout the year. These persons are reached: College of Agriculture faculty; county agents; vocational agriculture instructors physicians; state, county and municipal employees; sales and technical representatives of the agricultural chemicals industry; home gardeners; state, county and municipal elected and appointed officials; homemakers; producers of all agricultural commodities--anyone involved, in any way, with pesticide chemicals.

Purpose - To gather, interpret and distribute information about pesticides so as to promote the safe and efficient use of these essential tools and to thus avoid their misuse and associated hazards through a coordinated educational program.

Content - Development of a pesticide; Federal and State laws and regulations relating to pesticide registration, labeling and transportation, selling, application, storage disposal and residue tolerances; toxicities, formulations, hazards, interpretation of labels; pesticides in fires; effects on environment and non-target organisms; current status of commercial pesticide products.

Faculty - Ellsworth H. Wheeler, Professor
Herbert E. Wave, Assistant Professor
Robert L. Norgren, Assistant Professor
Frank R. Shaw, Professor
William B. Becker, Associate Professor
Plus colleagues in other departments.

Dates - Too numerous to list; every meeting, conference, school, etc., at which pests and pest control are discussed provides an opportunity for the faculty to emphasize proper and safe use of these pesticides.

These opportunities are not missed; those reached number in the thousands, perhaps millions, if one considers TV and radio.

ANNUAL SUMMER BEEKEEPERS MEETING

For the past three years, we have adopted the policy of having our Annual Beekeepers Meeting held in different counties with the idea that over a period of time, we could contact more of the beekeepers.

In 1966, we met at the Bristol County Agricultural School on July 9th. The featured speaker was Professor William Clarke of Pennsylvania State University who presented two excellent discussions on management of bees and on the production and processing of comb honey. Professor Clarke indicated what is essential for the production of good comb honey and how it should be processed after removal from the hive. Comb honey is a high quality product and commands high prices.

Other speakers included Dr. Frank R. Shaw, Professor, and William Wiley, Secretary of the Eastern Apicultural Society. Approximately 120 attended this meeting.

COUNTY BEEKEEPERS MEETINGS

At the County Meetings, Dr. Frank R. Shaw, Professor, has spoken on a variety of topi including production and processing of honey, identification and control of bee diseases, management of bees, bee behavior, bee poisoning and other topics.

Such meetings are usually held on weekends in order to permit the attendance of as ma beekeepers as possible. Attendance varies depending on a number of factors but ranges usu ally between 20 - 125 persons.

By means of this program, the beekeepers are brought up to date on new developments o the subject.

EXHIBITS OF HONEY AND OTHER BEEKEEPING PRODUCTS AND THEIR JUDGING

For several years we have conducted programs to improve the quality of honey, beeswax and to create a better understanding of the role and need of bees in agriculture.

In 1966, the two most important honey shows were the ones at Topsfield Fair and at th Eastern States Exhibition. At the Topsfield Fair three individuals, Dr. Roger Morse, Cornell University; Dr. Frank R. Shaw, University of Massachusetts; and Mrs. Charles Blanchar participated in judging. The Topsfield Fair Honey Show is the best exhibit of beekeeping products sponsored by any county. The products are of very high quality, competition is keen, and the public is obtaining choice quality honey products as a result.

At the Eastern States Exposition, three persons were involved in judging--Dr. Frank R Shaw, Professor; Mr. Richard Callahan, graduate student at the University of Massachusetts and Mrs. Elsie Johnson of Longmeadow. Since the products exhibited at Eastern States are usually selected from exhibits which have taken prizes at county exhibits, the honey show at Eastern States is also of fine quality.

EASTERN CONFERENCE, NATIONAL PEST CONTROL ASSOCIATION

This is sponsored jointly by the National Pest Control Association and the Department of Entomology and Plant Pathology, College of Agriculture, University of Massachusetts. It draws representatives from the entire Northeastern United States.

At the past conference, January 23-26, some 26 "faculty" participated in the program. A total of 150 paid registration fees. Subjects included were all-day workshops on roaches their biology and control; management, identification, and control of pests of outdoor living, including, primarily, stinging insects and flies. The final session sponsored control of birds and rodents and other mammals and a resume of recent developments in the pest control industry.

A conference manual is prepared for each conference.

IMPROVEMENT OF TREE PEST CONTROL MEASURES

Conducted by the Department of Entomology and Plant Pathology.

Information is given to municipal tree wardens, foresters, commercial arborists, nursery men, and extension personnel on the control of insect pests of trees. Such informatio is given frequently during the warmer months of the year in timely and seasonal letters of information. Occasional field meetings or workshops are conducted as the need arises. Whe requested or necessary, as in the past, impartial investigations of new pest control method are conducted and the results made known to these groups of people.

Purpose - To assist these tree workers to carry on their insect pest control activitie at the proper time with suitable measures in the safest manner possible. Hopefully, this will improve control of pests and reduce the needless or wasteful use of poisonous pesticides. Safety and common sense are always emphasized.

Faculty - William B. Becker, Associate Professor.

DEPARTMENT OF ENVIRONMENTAL SCIENCES

VEGETABLE GROWERS WORKSHOPS

The Department of Plant and Soil Sciences cooperating.

These workshops take the form of all-day meetings and three have been held, one each in December, January, and February, in cooperation with the New England Vegetable Growers Association.

Purpose - To assist vegetable growers in getting the latest information along with some of the basic principles of Culture, Weeds, Insect and Disease Control.

Content - The staff of the Departments and the University will present the latest data from research and Extension activities. It will cover weed control, Nematode life history, latest machinery for the mechanization of vegetable production, principles of irrigating vegetables, procuring and keeping labor, controlling insects, farm planning.

Faculty - Professors Robert E. Young, Cecil L. Thomson, William H. Lachman, Donald N. Maynard, and Richard A. Rohde; County Regional Agricultural Agents Walter Melnick, Dominic A. Marini, and R. Alden Miller.

Guest Lecturers - Dr. John Carew, Michigan State University
Dr. Arthur Muka, Cornell University

Growers - William Richards, Chester Matuszko, Walter Shannon, Donald Wilson, Robert Spence.

Dates Held - December 3, 1966; January 7 and February 4, 1967.

Attendance - Average of 100.

GREENHOUSE TOMATO EDUCATIONAL PROGRAM

There has been an all-day meeting to be followed by afternoon meetings scheduled once a month during the spring greenhouse tomato season in both Eastern and Western Massachusett

Those participating will be college staff, Regional Agents and specialists from other universities.

Purpose - To develop the Greenhouse Tomato industry to its fullest extent and to supply educational material that will permit both old and new growers to reach their fullest potential.

Content - The all-day program presented basic material to further the understanding o some of the principles of producing tomatoes in a greenhouse, and to build up an education to prepare the growers to make proper decisions during the growing seasons.

The afternoon programs permit the use of in-the-greenhouse training with visual materials.

Faculty - Professors Robert E. Young and Richard A. Rohde.

Guest Lecturer - Professor Fred Buscher, Ohio State University.

Date Held - November 18, 1966.

Attendance - 35

PLANT PHYSIOLOGY

Purpose - With the new technology developing for improvements in the production of flower crops, the functions of plants in relation to their environment must be understood. This course was developed to meet this need.

Fourteen, two and one-half hour sessions for fourteen weeks were conducted on Tuesday evenings from 7:30 to 10:00 p.m. at the Waltham Field Station. Topics covered were: Relation of Plant Anatomy to Function; the Role of Photosynthesis; Water in Relation to Plant Growth; Physiological Aspects of Short and Long-Day Plants; Auxins in Relation to Plant Growth; Effects of Enrichment of Atmospheres on Plant Growth with Carbon Dioxide (CO_2) and Some Physiological Aspects of Air Pollution on Plant Growth.

A demonstration was prepared for each of the fourteen sessions supporting the lecture topics. A text book by Dr. F. C. Stewart of Cornell University, "Plants at Work," was purchased by each student attending the course.

Faculty - Norman W. Butterfield, Professor
Mrs. Alice Kinoshita, Research Technician

Guest Lecturer - Professor Jay Koths, University of Connecticut

Attendance - Forty-four were registered for the fall of 1965 and sixteen for the fall of 1966.

ENRICHMENT OF GREENHOUSE ATMOSPHERES WITH CO_2

An educational program throughout the state to instruct the flower grower on the proper enrichment of greenhouse atmospheres with carbon dioxide, CO_2.

Purpose - To assist the flower producer in realizing greater profits from the proper use of carbon dioxide generators to enrich the atmosphere and to improve their quality of flowers through proper management of other factors such as watering practices, heavier feeding programs and higher night temperatures.

Content - An infra-red analyzer is employed to determine levels of carbon dioxide at several greenhouses and its relation to plant food, light intensity, and ventilation.

The manager of each firm participates in the collection of information for the analyzer to later assist him in making management decisions for future operation of supplying CO_2. Improvement in the gain of weight of flowers and foliage, in quality and in keeping ability and enrichment of color are all considered as measures resulting from the new technology. From the information, the grower can better plan his production schedule to hit peak holidays, periods of high demand for his product.

Faculty - Professor Norman W. Butterfield
County Regional Agricultural Agents William J. Bennett, Peter W. Larson, and H. Thurston Handley, Jr.

POULTRY HEALTH CONFERENCE

This conference is open to poultrymen, extension agents, servicemen, and individuals in allied industries.

Purpose - To provide educational information on several important aspects of poultry and public health problems. To improve the overall health and performance of our commercial poultry population through better sanitary and managerial practices.

Content - A review of the major health problems encountered during the previous calendar year. Recommendations for a planned immunization program with special emphasis on new vaccines or methods of application. Policy on recommendations for the use of pesticides to control poultry pests on farms including a general discussion on the statutory aspect and the hazards involved in the handling and application of most pesticides.

Faculty - George P. Faddoul, Professor
Gordon W. Fellows, Assistant Professor

Guest Lecturers - Martin Sevoian, Professor, Veterinary and Animal Sciences
Ellsworth H. Wheeler, Professor, Entomology and Plant Pathology

Date Held - April 27, 1966 at Waltham Field Station

Attendance - Approximately 75 individuals.

DIAGNOSIS OF SHADE TREE PROBLEMS

These courses are presented in two forms--a general course available to all arborists and a more intensive course available only to certified arborists and with enrollment limited to twenty. The more intensive course is being given twice with the cooperation of the Massachusetts Certified Arborists Association. Formal lectures are of two-hour length.

Purpose - To enhance the ability of the arborist to make diagnosis of shade tree disorders in the field.

Content - The course includes discussion of tools and methods, non-parasitic diseases, soils, parasitic diseases and insects.

General Course:

Faculty - Clifford S. Chater, Assistant Professor

Attendance - 127

Intensive Course:

Faculty - Clifford S. Chater, Assistant Professor
Robert E. Young, Professor

Guest Lecturers - Henry Davis, Jr., Dr. Warren D. Whitcomb, Dr. Philip L. Rusden, Dr. Emile Guba

Attendance - 36

COMMUNITY IMPROVEMENT PROGRAM - Grounds Maintenance Course

A series of six lectures is to be given one day a week as a comprehensive course in efficient grounds maintenance practices. This course is designed for maintenance personnel associated with school and park departments, industry, as well as professional landscape gardeners.

Purpose - An effective community improvement or beautification program depends upon efficient maintenance. Many of the people responsible for this task have had little or no professional training. The purpose of this course is to up date responsible persons in details of lawn construction and maintenance, pruning, fertilizing and pest control of ornamentals as well as the planning of flower gardens.

Faculty - Herbert C. Fordham, Instructor
William J. Garland, Instructor
James T. Williams, Middlesex County Extension Agent

Dates to be Held - Roxbury Series - February 21, 28; March 7, 14, 21 and 28.
Waltham Series - February 23; March 2, 9, 16, 23 and 30.

AIR POLLUTION

A six-week, two-hour per week course in the technology of air pollution held in Horticultural Hall, Boston, through the cooperation of the Massachusetts Horticultural Society, the Civic Center and Clearing House, and several Boston civic associations. Topics covered

included chemistry of air pollution, plant effects, animal effects, human effects, sources of air pollution, control of air pollution, citizen action and air pollution.

Faculty - Dr. John A. Naegele, Head of Environmental Sciences Department
Mr. John Putnam, Extension Specialist

Guest Lecturers - Commissioner Henry Foster, Massachusetts Department of Natural Resources
Dr. M. Ferris, Harvard School of Public Health
Dr. C. S. Brandt, USDA, U. S. Public Health Service
Dr. George Walsh, U. S. Public Health Service, Air Pollution Training

AIR CONSERVATION

Fourteen two-hour sessions for fourteen weeks for conservation and civic leaders held at the Waltham Field Station. Topics covered were meteorology, plant responses, animal responses, human responses, emission sources, economics of air pollution, chemistry of air pollution, community action and control. The course was designed for community decision makers and was designed to accomplish an awareness of the current technology of air polluti

Faculty - Dr. John A. Naegele, Head of Environmental Sciences Department
Dr. William A. Feder, Professor
Dr. William D. McEnroe, Assistant Professor

Guest Lecturers - Dr. Harold Walozin, University of Massachusetts-Boston
Mr. James Dalles, Massachusetts Public Health Service
Mr. David Standley, Massachusetts Public Health Service

Attendance - 25

AN INTRODUCTION TO WATER POLLUTION

A fourteen-week, two-hour per week course for the conservation and civic leaders designed to introduce the student to contemporary concepts in hydrology, water quality, water chemistry, water ecology, water self purification and water management. Conducted at the Waltham Field Station.

Faculty - Dr. John A. Naegele, Head of Environmental Sciences Department
Dr. Haim Gunner, Assistant Professor
Dr. William S. Mueller, Associate Professor
Mr. Glen A. Hemerick, Research Technician

PROBLEMS IN ENVIRONMENTAL MANAGEMENT

The Wellesley Adult Education Program and the Wellesley Conservation Committee cooperating.

Six two-hour sessions held on six consecutive weeks in the Wellesley High School. Thi course was designed to acquaint conservation and civic leaders with the current problems of environmental management. Included were discussions on the technical aspects of air pollution, water pollution, solid waste disposal, water quality, community health, and community action.

Faculty - Dr. John A. Naegele, Head of Environmental Sciences Department
Dr. Haim Gunner, Assistant Professor
Dr. William S. Mueller, Associate Professor
Mr. John Putnam, Extension Specialist

Guest Lecturers - Mr. Howard Rose, Quincy Public Health Department
Mr. Alfred Spada, Wellesley Public Health Department
Dr. James Sheehy, USDA, U. S. Public Health Service

Dates Held - Spring, 1966

Attendance - 150 from 25 communities and 45 organizations.

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

A lack of technical and economic information, or ability to obtain these is a serious problem in the food and food service industries. Food processors and others in the Massachusetts food industries require technical and economic information that will enable them to make the most efficient use of facilities, products and personnel in processing, marketing and distributing food products. Food industry firms are continually subjected to pressures from competitors, rising costs, and new or improved products. Knowledge of and application of new and improved methods and techniques can improve efficiency, increase productivity and provide better products and services.

The Extension programs of the Department of Food Science and Technology are primarily designed to provide educational training and technical assistance to the food processing, including dairy, and the food service industries of Massachusetts. An increasing emphasis is being placed upon training conferences and seminars. These methods and approaches to the conduct of Extension programs have been found to be particularly effective. In additi efforts are also spent on specific problems and technical needs of a particular firm or se ment of an industry. With this latter approach data can be obtained and materials develop to further assist and educate industry groups.

Illustrations of the department's Extension work during the past year and a half are presented below.

CONFERENCES, WORKSHOPS AND SEMINARS

1. Psychology of Personnel Management

A series of five 1½-hour classes for Massachusetts school lunch supervisors, at the request of the Massachusetts Department of Education.

Faculty - Dr. Donald E. Lundberg, Professor

Dates Held - June 28 - July 2, 1965 at Amherst

Attendance - 104

2. Personnel Management

A series of six 2-hour classes for owners, managers, supervisors, and other

personnel with supervisory and management responsibilities in Massachusetts hotels, restaurants, hospitals, and other food service firms. Held simultaneously at University of Massachusetts-Boston and at West Springfield, utilizing a telephone circuit.

Faculty - Dr. Donald E. Lundberg, Professor
Charles E. Eshbach, Associate Professor
Robert F. Lukowski, Extension Food Management Specialist

Guest Lecturer - Mr. Robert Parks, Vice President, Howard Johnson Company

Dates Held - Monday evenings during October and November 1965

Attendance - 123

3. Purchasing Food for Food Service Establishments

A series of eight 2-hour classes for managers, owners and others with responsibilities for food purchasing in a wide variety of food service establishments. Held simultaneously at University of Massachusetts-Boston and at West Springfield using a telephone circuit.

Faculty - Dr. Donald E. Lundberg, Professor; Charles E. Eshbach, Associate Professor; Robert F. Lukowski, Extension Food Management Specialist; Albert L. Wrisley, Jr., Assistant Professor; Dr. Ernest M. Buck, Assistant Professor; Kirby M. Hayes, Professor; Dr. Frank E. Potter, Associate Professor; and Robert M. Grover, Associate Professor, Department of Veterinary and Animal Sciences.

Guest Lecturers - Mr. Norton, Greater Boston Hospital Purchasing Council
Mr. Kenyon, USDA, Produce Inspection Service
Mr. Doody and Mr. Nobbs, John Sexton Company
Dr. R. C. Baker, Cornell University

Dates Held - Monday evenings during November and December 1965

Attendance - 92

4. 13th Annual Food Service Seminar

Co-sponsored by Massachusetts Food Service Educational Council and University of Massachusetts. Held at University. Program focused on changes that will determine the food service operator's future and included features on convenience foods, equipment, merchandising, legislative developments, and economic aspects.

Faculty - Charles E. Eshbach, Associate Professor, member of planning committee; and Dr. F. J. Francis, Professor.

Guest Lecturers - 10 speakers from industry and outside agencies.

Dates Held - January 26-28, 1966

Attendance - 190

5. Ice Cream Forum

Annual two-day conference for the ice cream industry held at the University.

Faculty - Dr. Frank E. Potter, Associate Professor
Dr. Denzel J. Hankinson, Professor

Guest Lecturers - Several speakers from industry

Dates Held - January 27-28, 1966

Attendance - 80

6. In-Service Training Course for Milk Sanitarians

A one-week course held at University, designed to up date sanitarians' technical knowledge of milk quality and to introduce the sanitarian to the requirements of the new 1965 U.S.P.H.S. Grade A Pasteurized Milk Ordinance. A loose-leaf reference titled "Dairy Sanitation Manual" was prepared by Professor David A. Evans. Supported by a $5,925 Short Term Training Grant from the U.S. Public Health Service.

Faculty - Dr. Denzel J. Hankinson, Professor, Director; David A. Evans, Assistant Professor; Dr. Frank E. Potter, Associate Professor; and Dr. Douglas N. Stern, Professor, Department of Veterinary and Animal Sciences; Robert G. Light, Associate Professor, Department of Agricultural Engineering; Dr. Ellsworth H. Wheeler, Professor, Departmei of Entomology and Plant Pathology.

Guest Lecturers - Harry Haverland, U. S. Public Health Service
Dr. R. S. Guthrie, Cornell University
Dr. D. W. Moeller, U. S. Public Health Service
I. R. Schlafman, U. S. Public Health Service
Professor R. R. Kountz, Pennsylvania State University
Nevis E. Cook, Director, Boston District, Federal Food and Drug Administration

Dates Held - November 15-19, 1965

Attendance - 82 representing six New England States

7. Food Science Research Seminar

Held at University for and at the request of research directors and administrators of General Foods Corporation, Tarrytown, New York, for purpose of reviewing resear programs of Department of Food Science and Technology and impact of new developments in fo science.

Faculty - Dr. William B. Esselen, Head of Department; Herbert O. Hultin, Associate Professor; Irving S. Fagerson, Professor; F. J. Francis, Professor; Charles R. Stumbo, Professor; Wassef W. Nawar, Associate Professor; and Robert E. Levin, Assistant Professor.

Date Held - January 14, 1966

Attendance - 12

8. Seminar on Wax Packaging in the Food Industry

Co-sponsored by Department of Food Science and Technology and American Petroleum Institute. Purpose of seminar was to bring executives with research, technical servic and sales backgrounds from primary wax producers, and the packaging and food industries, up-to-date on applications and uses of wax in food packaging. The people in attendance cam from all over the country, including the West Coast, Middle West, and South.

Faculty - Kirby M. Hayes, Professor; Arthur S. Levine, Professor; F. J. Francis, Professor; Frank E. Potter, Associate Professor; William B. Esselen, Department Head.

Guest Lecturers - Herman Kresse, Continental Oil Company, Houston, Texas
B. H. Clary, Petrolite Corporation, Tulsa, Oklahoma
Mrs. Julia Morse, Chirung & Cairns Advertising, Inc., New York, N. Y.
J. J. Devlin, Cities Service Oil Company, Tulsa, Oklahoma
Robert Kelsey, Editor, Modern Packaging Magazine, New York, N. Y.
John F. McGrogan, Atlantic Refining Co., Philadelphia, Pa.
Dr. Edward A. Nebesky, U. S. Army Natick Laboratories, Natick, Massachusetts
Hugh Parkhurst, The Gorton Corporation, Gloucester, Mass.
Robert DeNike, International Paper Company, New York, N. Y.

Dates Held - March 22-23, 1966 at Amherst

Attendance - 70

9. Seminar on Understanding Cooking

A series of eight two-hour classes for food service industry personnel, including owners and managers. Held at West Springfield. The principles of physics and chemistry behind many of the food service industry's practices and procedures in cooking were emphasized. Used in the seminar was a book on "Understanding Cooking" by Dr. D. E. Lundberg, the first programmed textbook on this industry's subject matter.

Faculty - Dr. Donald E. Lundberg, Professor; Robert F. Lukowski, Extension Food Management Specialist; and Charles E. Eshbach, Associate Professor.

Guest Lecturers - Mr. Siebert, Proctor & Gamble Company
Mrs. Joyce, Bureau of Commercial Fisheries
Mr. Banino, Ritz-Carlton Hotel, Boston
Mr. Carl Jensen, Restaurant-Waldorf Associates

Dates Held - Monday evenings during March and April 1966

Attendance - 80

10. Color Measurement in Foods

An intensive seminar-workshop designed to present theory and practice of food colorimetry and color tolerances of foodstuffs. Held in the department at Amherst.

Faculty - Dr. F. J. Francis, Professor; Kirby M. Hayes, Professor; Dr. Ernest M. Buck, Assistant Professor; and F. M. Clydesdale, Post-Doctoral Fellow.

Guest Lecturers - C. Harris, Instrument Development Labs., Attleboro, Mass.
Mrs. E. V. Deangelis, U.S.D.A., Washington, D. C.
Dr. R. S. Hunter, Hunterlab Assoc., Fairfax, Virginia

Dates Held - June 22-24, 1966

Attendance - 40

11. Functions of Food Purchasing

A series of five 1½-hour classes on the food purchaser's responsibilities in a food service firm, the problems encountered, and the techniques, methods, and procedures essential for efficiently handling the buying functions, for Massachusetts school lunch supervisors, offered at the request of the Massachusetts Department of Education.

Faculty - Charles E. Eshbach, Associate Professor; Robert F. Lukowski, Extension Food Management Specialist; Dr. Ernest M. Buck, Assistant Professor; Kirby M. Hayes, Professor; Dr. D. J. Hankinson, Professor; and Robert M. Grover, Associate Professor, Department of Veterinary and Animal Sciences.

Dates Held - June 27-July 1, 1966

Attendance - 125

12. 8th Air Force Open Mess Conference

A training course for 8th Air Force personnel in charge of open mess operations for the purpose of instruction on improved operational methods. Put on at request of 8th Air Force and attended by representatives from 8th Air Forces of the North American Continent.

Faculty - Dr. Donald E. Lundberg, Professor; Charles E. Eshbach, Associate Professor; Albert L. Wrisley, Jr., Assistant Professor; and Dr. Ernest M. Buck, Assistant Professor.

Guest Lecturers - Dr. Gerald Lattin, Cornell University
Professor Mathew Bernatsky, Cornell University
Donald Booth, U. S. Naval Station, Newport, Rhode Island
Richard M. Landmark, Club Manager's Association of America

Dates Held - July 11-16, 1966 at University of Massachusetts

Attendance - 31

13. Colorimetry in Food

A seminar on color and foods put on for and at request of nutritionists of the Massachusetts Department of Public Health.

Faculty - Dr. F. J. Francis, Professor

Date Held - September 12, 1966 at University of Massachusetts

Attendance - 15

14. Seminar on "Understanding Cooking"

A repeat of seminar (see #9 above) previously given in West Springfield but to serve people in Greater Boston area. Held at Waltham Field Station.

Faculty - Dr. Donald E. Lundberg, Professor; Robert F. Lukowski, Extension Food Management Specialist

Guest Lecturers - Charles Banino, Ritz-Carlton Hotel, Boston
Yves Menes, Ritz-Carlton Hotel, Boston
Clifford Robertson, Proctor and Gamble Company

Dates Held - Monday evenings, October 3-November 21, 1966

Attendance - 80

15. Ice Cream Forum

Annual two-day conference for the ice cream industry held at the University.

Faculty - Dr. Frank E. Potter, Associate Professor; Dr. D. J. Hankinson, Professor; David A. Evans, Assistant Professor; Dr. T. O. Wilkinson, Professor, Department of Sociology and Anthropology; and Earl I. Fuller, Associate Professor, Department of Agricultural and Food Economics

Guest Lecturers - Bruce W. Tharp, Drew Foods, Boonton, New Jersey; Jay Sandle Ice Cream Field and Trade Journal, New York, N. Y.; James D. Staggs, Friendly Ice Cream Corporation, Wilbraham, Massachusetts; Harold L. Janovsky, Globe Extracts, Inc., Long Island, New York; David H. Buttrick, Jr., The Buttrick Company, Arlington, Massachusetts

Dates Held - January 26-27, 1967

Attendance - 87

16. 14th Annual Food Management Seminar

Co-sponsored by Massachusetts Food Service Educational Council and University of Massachusetts at Amherst. Program focused on improving management techniques.

Faculty - Charles E. Eshbach, Associate Professor, member of seminar committe and Donald E. Lundberg, Professor

Guest Lecturers - V. W. Ringer, Statler Hilton Hotel, Boston; Carl E. Jensen, Restaurant & Waldorf Associates, Boston; Robert D. Parks, National Restaurant Association; Dr. L. A. Kotschevar, Michigan State University; Sonny Look, Look's "Sir-Loin," Houston, Texas; E. M. O'Riordan, Gillette Safety Razor Company, Boston; W. J. Slagle, Slagle Restaurants, Boston; J. A. Butler, I.B.M. Corporation, Cambridge; F. B. Mills, Sheraton Corporation, Boston; Dr. G. H. True, True-Klemp Organization, South Bend, Indiana; J. D. Healey, U. S. Naval Supply School, Newport, Rhode Island; R. Bodelson, U. S. Naval Supply School, Newport, Rhode Island; R. E. Lee, AMF Company, Springdale, Connecticut

Dates Held - January 25-27, 1967

Attendance - 250

17. Seminar on "Understanding Cooking"

A repeat of seminar (see #9 above) previously given at West Springfield and at Waltham. Presented at Osterville, Massachusetts, for benefit of Cape Cod resort operators.

Faculty - Dr. Donald E. Lundberg, Professor; and Robert F. Lukowski, Extension Food Management Specialist

Guest Lecturers - Peter Berrini, Sankany Head Golf Club, Siasconset
E. A. Hinckley, Chef, First National Bank, Boston

Dates Held - Tuesday evenings, January 10-February 14, 1967

Attendance - 50

18. Milk Plant Operators Seminars

A series of seminars has been initiated for the purpose of discussing with commercial milk plant operators technical and managerial opportunities for improving the efficiency of their operations in keeping with current trends within the industry.

Faculty - David A. Evans, Assistant Professor
John H. Bragg, Assistant Professor, Department of Agricultural and Food Economics

Dates Held - March 23 and May 25, 1966 at Framingham, Massachusetts

Attendance - 16

DEPARTMENT OF FORESTRY AND WILDLIFE MANAGEMENT

MUNICIPAL WATERSHED MANAGEMENT SYMPOSIUM

Water Resources Research Center, University of Massachusetts; Massachusetts Departmen of Natural Resources; and New England Water Works Association cooperating.

The formal program consisted of twelve technical sessions and a field trip of one-hal day's duration to observe forest watershed management practices at the largest reservoir i Massachusetts.

Municipal watershed administrators, watershed management technicians and foresters co cerned with technical forest management programs on watersheds participated. One hundred and twenty people registered for this symposium from the Northeast, Ohio and West Virginia to Maine. It was learned during this symposium that this was the first event of its kind in the country. Proceedings are being published.

Purpose - To indicate to municipal watershed administrators responsible for land management policy, ways in which forestry may enhance quality and quantity of water yields and the role of forestry in a total land management program.

Content - Subject content of the symposium was separated into three major categories dealing with (1) factors influencing water production quantity. Presentations here involved basic principles of the hydrologic cycle, the disposition of water in a forest and what happens to it, the effect of manipulating vegetation to increase water yields and the effects of long-term protection policy on water yields. (2) factors influencing water quality associated with forest land use. Specific water supply problems relating to forest recreation, timber culture and harvesting, insect and disease control and their relationship to water quality were considered along with current research activities in water quality. (3) factors relating to the economic aspects of watershed management. Costs and returns for several models of activities were presented. Emphasis was directed to the need for establishing forest land-use policy on public and private watersheds and the basic need for developing a complete watershed management program for such properties.

The field trip was used to examine on-the-ground forest management practices related to watershed properties.

Faculty - Professor Robert S. Bond, Program Committee; Professor Donald L. Mader, Program Committee and Lecturer; Professor William P. MacConnell, Lecturer; Professor John H. Noyes, General Chairman of Symposium and Lecturer; Richard Affleck and Peter Machno, Graduate Assistants.

Guest Lecturers - Dr. Bernard B. Berger, Deputy Chief, Office of Resource Development, Public Health Service, Department of Health, Education and Welfare, Washington, D. C. (Now on University of Massachusetts staff); Dr. Arthur R. Eschner, State University College of Forestry at Syracuse University, Syracuse, N. Y.; Dr. Ernest M. Gould, Jr., Forest Economist and Lecturer on Biology, Harvard Forest, Petersham, Massachusetts; Dr. V. S. Hastings, Head, Water and Land Use Section, Delaware River Basin Commission, Trenton, New Jersey; Mr. Howard W. Lull, Project Leader, Watershed Management Research, Northeastern Forest Experiment Station, Upper Darby, Pennsylvania; Mr. Alfred E. Peloquin, Chief, Water Quality Section, Public Health Service, U. S. Department of Health, Education and Welfare, Boston, Massachusetts; Mr. Robert S. Pierce, Project Leader, Watershed Management Research, Northeastern Forest Experiment Station, Laconia, New Hampshire; Dr. Richard J. Quinton, Supervisor, Agriculture and Forestry, Bridgeport Hydraulic Company, Bridgeport, Connecticut; Mr. Irvin C. Reigner, Research Forester, Northeastern Forest Experiment Station, New Lisbon, New Jersey; Mr. Kenneth G. Reinhart, Project Leader, Watershed Management Research, Northeastern Forest Experiment Station, Parsons, West Virginia; Mr. Bruce Spencer, Forester, Metropolitan District Commission, Belchertown, Massachusetts; Mr. Gilbert L. Varney, Chief, Branch of Watershed Management, Region 7, Forest Service, Upper Darby, Pennsylvania

Dates Held - November 9-10, 1965

Attendance - Mostly from the New England States but also from New York, New Jersey, Pennsylvania, West Virginia, Ohio and Washington, D. C. - 120

RESOURCE DEVELOPMENT AND PLANNING MEETINGS--ESSEX COUNTY, MASSACHUSETTS

Department of Landscape Architecture cooperating.

A series of five meetings on resource development and regional planning was scheduled in 1966-67 in cooperation with the Essex County Extension Service in order to inform leaders

of town and county government and quasi-governmental agencies about existing legislation and programs in local and regional planning.

Purpose - To bring information on the more recent legislation and planning programs being conducted throughout the state before the local leadership. Subject matter for the meetings was determined by a committee made up of representatives from various town agencies and county agencies. Specific invitations to the meetings went out to town conservation commissions, town planning boards, boards of selectmen, town managers and mayors, town finance commissions, county supervisors, conservation district supervisors, Extension Service personnel, the League of Women Voters and local watershed associations.

Content - The topics of the five meetings were:

1. Local planning for open space and recreation.
2. Discussion of coastal and inland wetlands acts and their relationship to town and county agency activities.
3. Review of new state water quality legislation with respect to the responsibility of town and county agencies.
4. Relationship of town planning activities to regional planning districts.
5. Review of new concepts of regional planning methods and regional landscape design.

The format of the meetings generally combined elements of lecture or panel discussion following.

Faculty - Professors Carl A. Carlozzi, Ervin H. Zube, Andrew J. W. Scheffey

Guest Lecturers - Mr. Jules Sussman, President, Massachusetts Association of Conservation Commissions
Mr. Bruce Gullion, Director, Division of Conservation Services, Massachusetts Department of Natural Resources
Mr. Arthur Brownell, Massachusetts Department of Natural Resources

Dates Held - May 19, June 16, October 20, December 8, 1966; February 2, 1967

Attendance - Varied from 55 to 150, mostly from town and county agencies.

DEPARTMENT OF PLANT AND SOIL SCIENCES

PLANT NUTRITION SEMINAR

This one-day seminar was held to discuss basic information concerning the broad field of plant nutrition. Topics were discussed by faculty members involved with plant nutritional research and by technical service representatives of major commercial fertilizer suppliers.

Purpose - To provide basic information within the broad field of plant nutrition to county agents and service personnel of fertilizer manufacturers and distributors in Massachusetts and throughout New England. These men are in direct contact with managers of our crop producing enterprises and provide them with soil management and plant nutrient application information. The quality of their suggestions and advice is apt to be directly related to their understanding of the underlying principles of plant nutrition.

Content - This program consisted of several topics discussed separately. Included were plant tissue testing, the role of lime in plant nutrition, recent developments in fertilizer formulation and application, and our current understanding of nutritional problems related to floricultural, forage, vegetable and fruit crops.

Faculty - Professors John H. Baker, Mack Drake, Donald N. Maynard, William A. Rosenau, Martin E. Weeks, and Walter D. Weeks.

Guest Lecturers - Dr. A. J. Ohlrogge, Purdue University; Mr. Tim Nourse, Farm Bureau Association; and Mr. M. J. Papai, Agway, Inc.

Date Held - November 17, 1966

Attendance - 125

IMPROVEMENT OF FRUIT PRODUCTION AND HARVESTING METHODS

Departments of Entomology and Plant Pathology and Agricultural Engineering and the County Cooperative Extension Services cooperating.

Purpose - To keep fruit growers informed of the latest research and technological developments which may be of significant economic value to them and provide a higher quality product to the consumer.

Content - During May, June and July weekly twilight meetings of about two hours' duration are held in Eastern Massachusetts. In Western and Southeastern Massachusetts similar meetings are held monthly. At these twilight meetings insect and disease control, use of growth regulators, nutritional problems, and the use of herbicides are discussed as they relate to crop production and fruit quality.

In addition, three major state-wide meetings of one or two day duration are held in the summer and winter. Such things as harvest labor-saving devices, labor problems, pre-harvest fruit drop control, clonal rootstocks, storage management, fruit storage disorders and their control, and fruit marketing methods are discussed at these meetings.

Faculty - Professors William J. Lord, William J. Bramlage, Franklin W. Southwick, Walter D. Weeks, Herbert E. Wave, Robert L. Norgren, and Lester F. Whitney.

Guest Lecturers - Dr. R. F. Carlson, Michigan State University; Dr. A. H. Thompson, University of Maryland; Dr. Elroy Krestensen, University of Maryland; Dr. K. D. Fisher, University of Vermont; Dr. Thomas Lamont, formerly of Cornell University; Norman Healy, U.S.D.A.; Professor Russell Eggert, University of New Hampshire; B. Peterson, New England Crop Reporting Service; P. L. Dudensing, Ocean Spray Cranberries, Inc., and Eugene Shertz, Arthur D. Little, Inc.

Dates of Major State-wide Meetings - July 13, 1966; January 5 and 6, 1967; February 13, 1967.

Attendance - Ranges from 25 at smaller twilight meetings to 400 to 500 at the large two-day winter meeting in January.

WINTER SCHOOL FOR TURF MANAGERS

Departments of Agricultural Engineering, Entomology and Plant Pathology, and Landscape Architecture cooperating.

An eight-week course of regular classroom instruction at the University to furnish growers of fine turf with current knowledge of all aspects of turf culture. It is open to superintendents of golf courses, cemeteries, parks, playgrounds and industrial and municip grounds. Landscape gardeners and maintenance personnel of airports and highway department are eligible, also. Topics covered include turf physiology and maintenance, pest control, soils and fertilizers, drainage, equipment, landscape operations, and business management. Enrollment is limited to 25 registrants.

Faculty - Professors Joseph Troll, William G. Colby, Ellsworth H. Wheeler, E. S. Pira and Gordon King.

Guest Lecturers - Mr. Albert Allen and Geoffrey S. Cornish.

DEPARTMENT OF VETERINARY AND ANIMAL SCIENCES

NEW ENGLAND DAIRY FEED CONFERENCE

This is a one-day conference held annually in Boston sponsored cooperatively by the six New England Land-Grant Colleges.

Purpose - To provide dairy feed manufacturers with the latest in research, and techni cal developments on the nutritional value of feeds and their application to the changing dairy situation so as to permit a most efficient and economical industry.

Content - Topics presented were: Use of Complete Feeds (Roughage and Concentrates in a Feed Bag); Explanation of Milk Pricing; Low Fat Tests Cause and Correction; Use of Urea as a Protein Supplement; Feed Management; and Supplementing Corn Silage.

Faculty - Professor Stanley N. Gaunt, Chairman; Sidney J. Lyford, Jr., Assistant Professor.

Guest Lecturers - Dr. Lynn Brown, University of Connecticut; Dr. A. M. Smith, University of Vermont; Dr. James Holter, University of New Hampshire; Mr. Richard Aplin, Boston.

Date Held - April 16, 1966

Attendance - 102

DAIRY FARMERS' SEMINAR

Conducted in cooperation with the Departments of Agricultural Engineering, Agricultur and Food Economics, and Plant and Soil Sciences.

The seminar is a two-day intensive presentation and discussion for leading dairymen and agricultural leaders and servicemen working with the dairy industry, including technic and management personnel of industry, vocational agricultural teachers, and extension pers nel.

Purpose - To provide dairymen and their leaders with the latest in scientific and bus ness developments to aid him in managing his income from production to marketing practices

Content - (A) In the marketing field, the alternatives in marketing agreements were discussed to meet the current problem due to the loss of nearby price differentials.

(B) On the second major current dairy problem, the critical labor shortage, specific suggestions were presented, including profit sharing, labor management, and farm adjustments.

(c) On production, a series of excellent illustrated talks was presented featuring new developments on: (1) the evaluation and selection steps in a dairy genetics program, (2) factors affecting quality milk, (3) mastitis control, (4) current feed situation, (5) feed adjustments, (6) vacuum silage, and (7) soil testing.

Faculty - Professors Stanley N. Gaunt, Chairman, John H. Bragg, Bradford D. Crossmon, Earl I. Fuller, Douglas N. Stern, Denzel J. Hankinson, Sidney J. Lyford, Jr., and Martin E. Weeks.

Guest Lecturers - Dr. Stewart Johnson, University of Connecticut; Steven Verrill, Dairyman, Concord; Raymond Grandone, Grandone Feeds, Inc., Westwood; Dr. J. L. Albright, Purdue University; Professor J. A. McCurdy, Pennsylvania State University; Professor J. H. Whitaker, University of Connecticut; Dr. W. T. McAllister, University of Delaware; Dr. H. Wilmot Carter, Cornell University; Ralph Cooley, dairyman, Ghent, N. Y.; Harry Whiting, dairyman, Berkshire; Donald Smiaroski, dairyman, Deerfield; Arthur Wyman, dairyman, Bridgewater; Dr. J. L. McIntosh, University of Vermont.

Dates Held - January 25 and 26, 1967

Attendance - 240

DAIRY GENETIC PROGRAM

This is a continuous program designed to reach the commercial dairyman, the purebred breeder, sire selection committee members of artificial breeding associations, regional specialists, vocational agricultural teachers, and others interested in dairy cattle improvement. The program is carried out through meetings and schools organized by Extension and through dairy breed organizations, particularly artificial breeding associations.

Purpose - To provide educational information to dairymen and breeders to aid them in gaining genetic improvement in their herds for greater profit.

Content - Basic phase of the program is on the farm milk production testing program (DHIA). Results of these tests are evaluated to determine the genetic merits of the cattle. These are presented and discussed in reports, articles and leaflets, meetings, schools, and conferences during the year.

Faculty - Professors Stanley N. Gaunt and Frank N. Dickinson

Guest Lecturers - Dr. H. Wilmot Carter, Cornell University; Charles Krumm, Manager, Eastern Artificial Breeding Cooperative; Dr. Hilton Boynton, University of New Hampshire; Elmer Clapp, Sire Analyst, Eastern Artificial Breeding Cooperative

Dates Held or to be Held and Attendance

April 2, 1966 - "Sire Evaluation" - Meeting of Artificial Breeding Cooperative - 85
April 5, 1966 - Talk on "Genetic Markers" - Meeting of Guernsey Association - 45
May 17, 1966 - Training Meeting of Sire Committeemen - 53
July 26, 1966 - Dairy Cow Utility Evaluation School - 44
August 17, 1966 - Sire Committee Evaluation Meeting - 36

October 13, 1966 - "Sire Sampling Programs" - Members of Artificial Breeding Association - 60
November 9, 1966 - Directors, Massachusetts Purebred Dairy Cattle Association - 20
December 3, 1966 - Genetics of Milk Composition at Annual Meeting, Holstein-Friesian Association - 60
January 2-4, 1967 - Eastern Dairy Sire Conference-Herd Improvement Talks - 145
January 10, 1967 - In-Service Training Session for Regional Specialists - 16
January 25, 1967 - Dairy Farmers' Seminar - 240
February 16, 1967 - Southeast Dairy Breeding School - 31
February 20-21, 1967 - Western Massachusetts Dairy Breeding School - 44
March 2, 1967 - Southeast Region Meeting of Artificial Breeding Association - 133
March 20-24, 1967 - Northeast Massachusetts Dairy Breeding School - 29

IN-SERVICE TRAINING

Nine monthly all-day training meetings from October 1966 through June 1967 have been set up for Regional Specialists and Agents in the dairy field. Five are being held at the Worcester Extension office and four at the University.

The training is directed to the following specialized subject matter areas: nutritio feeding high producers, new computer (central processing) DHIA system, environmental contr storage of forage, animal disease control, animal genetics, communications (writing), chem ical weed control, insect control, planning and budgeting, new government barn regulations and dairy progress development.

Faculty - Professors S. N. Gaunt (chairman), F. N. Dickinson, E. I. Fuller, M. E. Weeks, J. Vengris, E. H. Wheeler, S. J. Lyford, Jr., R. G. Light, L. D. Rhoades, D. N. Stern, David A. Evans

Guest Lecturers - Professor J. H. Mitchell, English Department, University of Massachusetts

MASSACHUSETTS CAGED LAYER SEMINAR

A full day and evening presentation of information directed to the specific interests of caged layer plant operators. Allied industry representatives serving the market egg production industry were also invited.

Purpose - To permit an in-depth discussion of the factors involved in the successful management of heavy type chickens in wire cages. To acquaint the industry with sources of additional technical information, and importantly, to provide a climate in which agribusinessmen having similar interests could seek the solution to management problems on common grounds.

Content - A. Planning a Caged System - this section directed to those individuals currently considering adoption of this management system.

1. Site selection and development.
2. Construction design.
3. Contract negotiation.
4. Equipment and lay-out for new facilities.
5. Equipment and lay-out for remodeled facilities.

B. Management of Caged Systems - this section discussed the interacting forces affecting production performance and was directed to those individuals who are

practicing this management system.

1. Environmental considerations.
    a. Bird density.
    b. Feeding systems.
    c. Lighting.
    d. Temperature and ventilation.
    e. Waste management.
    f. Water management.
2. Genetic progress.
3. Health.
4. Nutrition.
5. Replacement rearing.

Faculty - Donald L. Anderson, Associate Professor; William H. Collins, Assistant Professor of Agricultural Engineering; John W. Denison, Instructor; George P. Faddoul, Professor of Environmental Sciences; Thomas W. Fox, Head, Department of Veterinary and Animal Sciences; Robert M. Grover, Associate Professor; Howard F. Knight, Regional Extension Poultry Specialist; Louis H. Ruggles, Regional Extension Poultry Specialist; Walter B. Shaw Regional Extension Agricultural Engineer; Charles Yergatian, Regional Extension Poultry Specialist.

Guest Lecturers - Norman Hecht, Hecht's Hatchery, Walden, New York; Dr. W. C. Skoglund Head, Department of Animal Sciences, University of New Hampshire; H. C. Whelden, Jr., Extension Poultry Specialist, University of Maine.

Attendance - 60 poultry farm operators, representing an annual volume of approximately nineteen million dozen eggs and allied industry representatives.

In order that the attendance be comprised of those directly interested in the subject of caged layer management, a minimum of advance publicity was given the seminar. From fewer than one hundred invitations extended, sixty chose to participate.

Commentary: The Caged Layer Seminar typified the sort of meeting program which better fulfills the educational requirements of today's poultry industrymen than does the traditional Poultry Day event covering a more general and wider range of interests. The format is one which will be used with greater frequency in the future. As the size of business operation becomes larger, interests become increasingly specialized and managers demonstrat greater ability to benefit from in-depth discussion.

Of interest, too, is the fact that much of the more applicable technical information presented at the seminar described above was reported by members of the regional extension staff.

MASTITIS MANAGEMENT

(A) A series of four 2-hour sessions conducted two days a week for two weeks for dairy farmers and milking machine technicians. Only one phase presented in depth at each session Phases covered included bacteriology, anatomy, sanitation, milking machine function, and husbandry practices. Lectures supplemented with films, charts, actual udders, and demonstrations on the farm. Printed material also prepared. Three of these series conducted in Pioneer Valley, Worcester area, and Bristol-Plymouth area.

Faculty - Douglas N. Stern, Professor; Stanley N. Gaunt, Professor; David A. Evans, Assistant Professor; Curtis A. Johnson, Associate Professor, Agricultural Engineering;

Regional Agricultural Specialists Roger M. Harrington and Daniel P. Hurld, Jr., and Regiona Agricultural Agent Malcolm E. Hill.

Attendance - Limited to 25 pre-registrants.

(B) A series of two 4-hour sessions conducted once a week for two weeks for state milk collectors, laboratory personnel, and regional agricultural specialists. Subject matter stressed screening tests, laboratory procedures, sample collection methods, sanitation, and milking machine function. Held at University of Massachusetts.

Faculty - Douglas N. Stern, Professor; William K. Harris, Professor; Miss Barbara Mitchell, Staff Assistant; Miss Peggy A. McConnell, Instructor; Curtis A. Johnson, Associat Professor, Agricultural Engineering; David A. Evans, Assistant Professor.

Attendance - 20

(C) A series of two 4-hour sessions conducted once a week for two weeks for state and federal regulatory veterinarians. Subject matter covered all phases including on-the-farm surveys to supplement laboratory analysis. Held at University of Massachusetts.

Faculty - Douglas N. Stern, Professor; Stanley N. Gaunt, Professor; David A. Evans, Assistant Professor; William K. Harris, Professor, Miss Barbara Mitchell, Staff Assistant; Miss Peggy A. McConnell, Instructor; Curtis A. Johnson, Associate Professor, Agricultural Engineering.

D. One 4-hour session for dairy herd supervising veterinarians. All phases of progra covered. Problem solving stressed in area of laboratory report interpretation.

Faculty - Douglas N. Stern, Professor; William K. Harris, Professor.

BOVINE STERILITY MANAGEMENT

A series of two 4-hour sessions for dairy farm managers. Subject matter included anatomy, physiology, endocrinology, infectious and non-infectious causes of sterility and abortion, record keeping. Supplemented with 2 x 2 slides, charts, reproductive organs, an printed material. One conducted in Pioneer Valley, and one in Bristol-Plymouth area.

Faculty - Professors Douglas N. Stern and Stanley N. Gaunt; local veterinarian

Attendance - 55.

RUMINANT NUTRITION SEMINAR

A series of two 6-hour sessions for veterinary practitioners and regional agricultura specialists. Subject matter included physiology, feed additives, minerals, haylage, residues, ketosis. Stressed nutritional requirements for animals suffering from malaise in contrast to healthy ones. Held at University of Massachusetts.

Faculty - Professors D. N. Stern, S. N. Gaunt, S. J. Lyford, Jr.

Guest Lecturers - Dr. Lane Moore, U.S.D.A.; Dr. T. Reid, Cornell University; Dr. Lynn Brown, University of Connecticut.

Attendance - Limited to 30.

COLLEGE OF AGRICULTURE

DIVISION OF HOME ECONOMICS EXTENSION

Introduction

Home Economics Extension is an adult education program on subjects and problems related primarily to family, home and community life. The program of the Division of Home Economics Extension, University of Massachusetts, can be classified into two areas of emphasis.

Continuing Education opportunities organized by the Division for citizens to increase their knowledge, skills, appreciation and sensitivity. The opportunities are programmed through seminars, workshops, conferences, meetings and programs over both television and radio. During a year, there are 25 to 30 different subjects offered to the general public or a specific special interest audience (professional and/or lay) with an attendance which will vary from 20 to over 100. Ninety per cent of the programmed opportunities are a series from three to ten sessions. The television effort is a weekly program over WHDH-TV, Boston, which is produced by state and county Extension Home Economists. The radio programs are by the state Extension faculty on the Four College Radio, WFCR.

Problem Centered Projects for which lay groups advise as to the areas of concern and assist staff in working out ways in which the problem or facets of the problem may be affected by educational methods. A total of 375 citizens of the Commonwealth are members of these advisory groups.

The greatest difference between the two areas, Continuing Education and Problem Centered Projects, is in methods and clientele. The subject matter, with adaptations, is much the same. In the Problem Centered Projects the faculty develop teaching materials which lay leaders are trained to use in small community study groups organized by the County Extension staff. The Division faculty trained 1,160 individuals in the past year to function as teaching leaders. The leaders and group participants are primarily middle income homemakers with high school education. The homemakers are organized in small community study groups.

Members of the Advisory Councils are, for the most part, members of the study groups. Beyond doing study, it is expected that participants will give leadership to change, not just be satisfied with the collection of information, facts and new knowledge.

Special Clientele

The Low-Income Family has received special attention by the Division since 1962. The Division has made a special effort to program for the low-income family by developing teaching materials, training county staff and other professionals and by doing some direct teaching, thus to learn first hand the problems of the families.

A study was made in 1963 with a follow-up in 1964 in South End, Boston. The study was to determine if Extension methods could affect change with low-income families. The study gave the Division of Home Economics state and county staff backing to go ahead and develop projects with the families of our center cities. During the past year, projects with the clientele have been in progress in Greenfield, Pittsfield, Springfield, Worcester, Lawrence, Lynn, Malden, Boston (South End and Washington Park), New Bedford, and Taunton.

Blinded Homemaker groups have been meeting monthly in Middlesex, Plymouth, and Worcester Counties. The homemakers have declared the effort has been helpful; they have learned new methods, have been made aware of new products and have had an opportunity to exchange ideas. The Massachusetts Association for the Blind has assisted the County Extension Home Economists in organizing the homemakers for instruction.

Home Economists are now cooperating with the Massachusetts Commission for the Blind as a part of the rehabilitation team for newly blinded homemakers; they serve as resource persons for the Home Teachers of the Blind and are used as referrals for direct teaching of newly blinded homemakers.

Problems of Families on which the total program of the Division for all audiences is focused:

Management of money and other family resources
Human development and family relationships
Art and design, home decoration and furnishings
Food, nutrition and health
Housing for the family
Consumer education
Leadership development for community needs

Examples of Extension Programs Carried by the Extension Division Faculty

MANAGEMENT

Management is a dynamic process of developing competences to:

Establish values which give meaning to personal, family, and community living; select goals appropriate to these values.

Create a home and community environment conducive to the healthy growth and development of all members of the family at all stages of the family cycle.

Make and carry out intelligent decisions regarding the use of personal, family, and community resources.

Establish long-range goals for financial security and work toward their achievement.

Plan consumption of goods and services - including food, clothing, and housing - in ways that will promote values and goals established by the family.

Purchase consumer goods and services appropriate to an over-all consumption plan and wise use of economic resources.

Perform the tasks of maintaining a home in such a way that they will contribute effectively to furthering individual and family goals.

The programs listed below are directed toward developing these competences.

Home Management - a seminar focused on family values and management, family decision making, food selection and buying, food and health, and family finances.

Participants - Teachers and leaders of Today's Urban Disadvantaged Family

Dates	Place
October 11, 14, 25,	University of Massachusetts/Boston
November 15, 18, 22, 29, 1966	
March 7, 14, 21, 28, 1967	University of Massachusetts/Boston

Attendance

October - 25
March - 18

Faculty - Verda M. Dale, Professor, Extension Management and Family Economics
Harriet J. Wright, Associate Professor, Extension Nutrition and Food
Barbara Higgins, Professor, Extension Management and Family Economics

Guest Lecturer - Mrs. Ione Vargus, Supervisor Home Development Services, Roxbury Multi-Service Center

Managing for Family Satisfaction - a series of work meetings where individuals use work sheets and forms as guides to help analyze their present situation regarding use of time, energy, equipment, money, skills and knowledge. Each is encouraged to think through her own family situation and to work out a plan to achieve the family's objectives.

During 1966-67, the series was held in Barnstable, Dukes, Bristol, Norfolk, Middlesex, Franklin, Hampshire, and Plymouth Counties. State and/or county staff (county staff are trained by the state specialist) conduct the series for 15-20 homemakers in each group.

Participants - Lay

Dates	Place
Fall 1966	Norfolk County
Fall 1966	Bristol County
Spring 1967	Middlesex County

Attendance

15-20 each series

Faculty - Barbara Higgins, Professor, Extension
Management and Family Economics
County Home Economists

HUMAN DEVELOPMENT AND FAMILY RELATIONSHIPS

The Home Economics Extension Program in Human Development and Family Relationships is based primarily on the academic disciplines of developmental psychology and family sociology. Projects are intended to provide adults with opportunities to study and discuss ways in which family life may be enriched through the understanding and application of reliable data concerning human growth and development and principles of healthy, constructive human relationships. The specific goals are:

To help families, parents and youth to understand their own development at the various stages of the life cycle.

To help individuals and families to understand interpersonal relationships within the family (husband-wife, parent-child, sibling, in-law) at the various stages of the family life cycle.

To help leaders of youth in organizations (4-H, church, scouts) to understand ages and stages of youth, and to be aware of teaching and leadership methods applicable to youth.

Human Relations in the Family - various projects designed for the study and discussion of the crucial relationships within a family (husband-wife, parent-child, siblings, in-laws) with emphasis upon the effects of interpersonal relationships upon human development.

Participants - Homemakers; leaders of community organizations

Dates	Place	Attendance
March 1, 1967	Barnstable County	27
March 8, 1967	Barnstable County	34
March 15, 1967	Barnstable County	36
April 13, 1967	Essex County	35
April 21, 1967	Hampshire County	28
May 11, 1967	Plymouth County	32

Faculty - Joseph D. Burroughs, Professor, Extension
Human Development

ART AND DESIGN

Without question our taste and creative urges are born and nourished in our homes, and they are the products of the values held there .... . Women are creators of values. Their job is to select raw materials and use them to make life worth living .... . Art to many is associated with the accessories and frills of life and people are considered

artistic if they paint, carve figures, or create interiors* Art can mean more to a family than a superficial activity for its members - it can be the basis for a rich full life.

The objectives of the program are as follows:

To develop an interest in, appreciation of and understanding of the elements of art and design as basic to any decision or choice of furnishings for the home.

To develop a sense of the significance of the relationship of the human and his potential to home furnishing choices.

To develop a sense of competence and security in making design decisions for his home based on exposure to and experience with objects of good design.

To appreciate and appraise aesthetic values of clothing and textiles.

To understand and apply the principles involved in achieving appropriate and becoming dress.

American Dress and Decoration - series of study meetings to explore some of the design relationships and parallelisms of architecture, interiors and clothing in periods of colonial 18th, 19th, and 20th centuries.

Participants - Lay

Dates	Place	Attendance
January 5, 12, 19, 26, 1967	Middlesex County	30
April 6, 13, 20, 27, 1967	Plymouth County	15

Faculty - Mrs. Rosa S. Johnston, Associate Professor, Extension Textiles, Clothing and Environmental Arts
Virginia Davis, Associate Professor, Extension Textiles, Clothing and Environmental Arts

Why We Dress As We Do - a series of in-depth study meetings, including an introduction to the psychological aspects of clothing; the relation of clothing to social behavior, and the role of clothing in self-expression and self-image.

Participants - Professional and Lay

Dates	Place	Attendance
February 2, 9, 16, 23, March 2, 9, 1967	Eastern Massachusetts Teachers Association	14
April 14, 21, 28, May 5, 1967	Plymouth County	15

*From Speech by Jennie Rowntree, "Values in Action," International Design Conference, 1957.

Faculty - Virginia Davis, Associate Professor, Extension
Textiles, Clothing and Environmental Arts

NUTRITION, FOOD AND HEALTH

"The history of nutrition is the history of life on this planet. It has been and is a tool of politics, of war, and of conquest. It has affected exploration, discovery, colonization and the fate of populations. In modern life, it involves agriculture, transportation, industry and trade and with them all the socio-economic, scientific and cultural aspects of our society; all to the aim in the end, of the health and vigor of the individual human being, and the prevention, treatment, and recovery from disease." -- J. B. Youmans, American Journal of Medicine. 25:659, 1958.

The Home Economics Extension Program offers courses in nutrition, food and health which are formed on current problems and concerns. The goals of the program are as follows:

To help individuals and families to understand their nutrition needs throughout the life cycle.

To promote health and pocketbook protection for people by increasing knowledge levels that will enable them to make --
safe and effective use of products
wise selections and
discriminatory evaluation of advertising.

To help individuals and families to bridge the gap between what is known and what is practiced in the areas of food, nutrition and health.

To help families be more aware and have a better understanding of the need for developing sound food attitudes and habits in children.

Nutrition Conversations With the Community - a series of meetings on current nutrition concepts as they are influenced by the social and economic environment - including criterion for sound nutrition, nutrition in human development, current nutritional status in the U.S.A., changes in American food habits, weight control, and the danger of nutritional fads.

Participants - Professionals and Lay

Dates	Place
October 31, November 7, 14, 21, 1966	University of Massachusetts/ Amherst

Attendance - 60

Faculty - Harriet J. Wright, Associate Professor, Extension
Nutrition and Food
Dr. Mark Bert, Assistant Professor
Nutrition and Food

Mrs. Gladys Cook, Associate Professor
Nutrition and Food

Vitamin Supplements and Their Correct Use - a program to increase the knowledge level as regard man's need for vitamins which are available in food and pill form. The focus is on the indiscriminate use of pills by many Americans.

Participants - Lay Teaching Leaders

Dates	Place	Attendance
January 11, 1967	Hampden County	12
January 31, 1967) February 1, 7, 1967)	Middlesex County	47
March 14, 1967	Dukes County	28

Faculty - Harriet J. Wright, Associate Professor, Extension
Nutrition and Food

HOUSING FOR THE FAMILY

Approximately one-fourth of our national wealth is in the form of city and village dwellings - making housing important economically. Winston Churchill once said, "We shape our buildings and afterwards our buildings shape us." -- suggesting housing as a social influence. When these two aspects are coupled with the idea of primary use by families, residential housing becomes a topic of central concern to the field of Home Economics.

In considering this area for study many facets appear. Goals of the program are to:

Gain an appreciation of residential "settings" in the United States; i.e., cities, villages, new towns, developments and neighborhoods. The "ideal" concept is frequently helpful in providing a contrast to the existing establishments.

Learn the variability available in the layout and elevations of modern dwellings.

Increase knowledge of quality, both in materials and workmanship.

Develop skill in spending housing dollars wisely in relation to the family needs.

Become acquainted with the specialized facilities designed for elderly, vacationist, and lower income families.

Examine trends in an attempt to understand the exciting changes occurring in this basic industry.

The study of housing is the study of our close environment for all of our sleeping and much of our waking hours. We are permitted to choose

in making our housing decisions. A posture for intelligent choice is the goal of the study of residential housing. Program below relates to goals above:

Residential Housing - a series of meetings on decisions regarding site selection, house design, plans and specifications, materials and economics of house construction.

Participants - Employees of a Holyoke company (the company will be moved to Lee, Massachusetts, in September 1967. All employees ((175 families)) who move must select different housing.)

Dates	Place	Attendance
November 9, 16, 30, December 7, 1966	South Hadley Falls	25

Faculty - Edward K. Knapp, Assistant Professor, Extension Management and Family Economics

CONSUMER EDUCATION

"A free economy depends on rational consumer choice. If consumers cannot choose wisely, if they regularly reach their decisions in a state of wonder and perplexity, if they make their choices on the basis of meaningless or irrelevant claims, a free economy suffers ..... . It is the consumer's decision that helps direct the flows of investment, of labor, of natural resources. If his decisions are based on something less than full information, the possibility of wasting capital, labor, and natural resources is increased." (Report of the Consumer Advisory Council for 1966, Washington, D. C.)

The Home Economics Program in Consumer Education is directed to the principle that consumers have the right to be informed. The program has as a primary goal the competence of the consumer in the market place and the reflection of this competence in the total welfare of individuals and families.

The programs listed below have as their primary goal, information and techniques concerned with quality evaluation, product performance, economic judgment and consumer protection.

Economics and the Consumer - a seminar which focused on the characteristics and the problems of the consumer - concepts of demand, pricing, quality, competition, art of selling, credit, spending patterns, law, and the consumer movement..

Participants - Professionals in Education and in Service Agencies

Dates	Place
October 6, 13, 20, 27, November 3, 10, 17, 1966	University of Massachusetts/Boston

Attendance - 30

Faculty - Marjorie M. Merchant, Associate Professor, Extension Management and Family Economics

Consumer and the Market Place, WHDH-TV, Boston - programs emphasized changes in products, relationship of consumer expenditures and demand to availability, selection, pricing of both goods and services.

Dates	Place
October 5, 12, 19, 26, November 2, 9, 16, 23, 30, 1966	WHDH-TV, Boston

Faculty - Marjorie M. Merchant, Associate Professor, Extension Management and Family Economics

LEADERSHIP DEVELOPMENT

Leadership is to exert influence, small or great, upon an individual or a group. Leadership is also supplying a function needed by an individual or group when it is necessary--not that anyone particular person supplies the function, but that someone does. The belief in a democracy is that leaders are everywhere in the population and can be recruited and trained to do the many leader functions necessary for society's good.

The Extension Service Program offers support to leadership, declared and yet to be recruited, in the following roles: parents, service to the community, and maintaining the functions and tasks of an organization.

Leaders and professionals express the need to explore and study facets of leadership such as:

Finding and training volunteers for social and educational needs.

Relationship of the professional and the lay leader.

Functions of a council to the Extension program.

Leadership as self-development and continuing education for service either volunteer or paid.

In 1962, Sears-Roebuck Foundation gave support to a statewide workshop on the Volunteer in Today's Culture, organized by the Division. The support has continued for workshops in the counties, planned by the Division and the particular county.

Volunteer in Today's Culture - conference on new dimensions in training, relationships, supervision and expanded opportunities for the volunteer.

Participants - Professionals and Lay Volunteers

Date	Place	Attendance
October 12, 1966	Plymouth County	125

Faculty - Dr. Ellsworth Neumann, Administrator, Massachusetts General Hospital
Robert McCreech, Director, School and Volunteer Bureau, United Community Services of Metropolitan Boston

MASS MEDIA

Conversation - Four College Radio WFCR, Amherst. Tapes are also used by WGBH, Boston; WAMC, Albany; WAMU, Washington, D. C. and WAER, Syracuse.

Half-hour weekly discussions on topics of house, home, family and community. Typical subjects:

Kinds and Cost of Credit, January 5
Nutrition Quackery, March 30
Food and the Nation, April 27
Innovation in Fabrics and Fashion, May 25
Culturally Disadvantaged and Early Childhood Experiences, February 2

In-Service Training for County Extension Home Economists

The Division faculty has a commitment to keep the County Extension Home Economists trained in subject matter for their role as teacher. This includes training at the University, conferences in the county and communications by telephone and letter. The estimated amount of work of any one Division faculty for this assignment would be 1/8 to 1/6 of his or her time.

The Division started a three-year professional development program in December 1965 for both county and state Home Economists. The faculty for the program was selected from the Center for the Study of Liberal Education for Adults, Boston University. The focus has been on the adult educator working in an urban environment with individuals, families, (middle-income and low-income) and with other agencies. Thus far, the Center faculty has had three two-day seminars with the Home Economists plus several single day sessions for each task force. The total group has divided into three task forces which meet periodically with one faculty member of the Center.

The program has been in progress for 18 months. Most participants are in high praise of the opportunity. Plans were made at the June 1-2 seminar to continue through 1968.

Summary

This report has given only a small number of the different but typical programs organized by the Division in the year. The focus of the program has been the family and the problems of the family and individuals in the family. The county Extension staff and other professionals working with the family represent the field staff and are vital to the effort of the Division both in organizing for the Continuing Education workshops, seminars, etc., and in the Problem Centered Projects where lay teaching leaders are involved.

COLLEGE OF AGRICULTURE

1966-67

SECTION III -- RESEARCH

HIGHLIGHTS

EXPERIMENT STATION

RESEARCH PROJECTS

HIGHLIGHTS

Environmental Sciences

Significant accomplishments of the department include:

Introduction of a new carnation variety, "Boston Marathoner," recipient of national awards.

Development of the Waltham Hi Color Carrot, now the backbone of the carrot industry.

Appointment of Warren Litsky as Special Consultant to Federal Water Pollution Control Administration, Department of the Interior; and Division of Hospital and Medical Facilities, U. S. Public Health Service, Department of Health, Education and Welfare.

Food Science and Technology

Travel grants to attend and participate in the Second International Congress on Food Science and Technology, Warsaw, Poland, August 1966, were received by William B. Esselen, Frederick J. Francis, and Charles R. Stumbo. These grants were made by the National Institutes of Health through the Institute of Food Technologists.

At the department's U-Mass Alumni Luncheon at the annual meeting of the Institute of Food Technologists, Minneapolis, Minn., 96 persons were present - a record. Of the 154 scientific and technical papers presented at this meeting, eight were presented by faculty of the department and an additional 17 by alumni of the department with academic, governmental and industry affiliations.

Forestry and Wildlife Management

Federal appropriations for the Cooperative Wildlife Research Unit for the next fiscal year will be $40,000, an amount more than double that granted before to the Unit. The University was commended for outstanding work in wildlife research and conservation to merit this increase in funds.

A $78,000 contract with the Office of Water Resources Research (Department of the Interior) for a three-year project, commencing in July 1967, to study the allocation of water resource use in a small watershed was completed.

COLLEGE OF AGRICULTURE

MASSACHUSETTS EXPERIMENT STATION

The purpose of the Massachusetts Experiment Station is to conduct scientific investigations of problems relating to the agricultural industry of the state in its broadest aspects.

The objective of these investigations is to discover the fundamental principles underlying the behavior of plants and animals, to determine the economic and biological factors relating to the constructive use of our renewable resources, and to develop better methods of using the products of these resources for the improvement of the economy of the Commonwealth.

In the conduct of scientific research, the College of Agriculture's objective has been, and will continue to be, a concentration of available funds on fewer but better projects. Allocations are based on competence, not time, with an end-goal of quality and production.

Programs of the Experiment Station consist of the following general areas of work:

Conservation, Development and Use of Soil, Water, Forest and Related Resources.

Protection of Man, Plants, and Animals from Losses, Damage, or Discomfort Caused by Insects, Diseases, Weeds, Fire and Other Hazards.

Efficient Production and Quality Improvement of Plants and Animals, Consumer Acceptability, Mechanization of Physical Efficiency, Management of Inputs to Maximize Agricultural Income.

Food and Non-Food Product Development and Processing.

Efficient Marketing, Including Pricing and Quality.

Development of Human Resources and of Communities and Areas.

DEPARTMENT OF AGRICULTURAL AND FOOD ECONOMICS

J. B. Wyckoff, Head

The Department of Agricultural and Food Economics research program has been active during this past year with the majority of the effort being aided by graduate assistants. The number of Extension studies far exceeds the number of research studies done under the auspices of the Experiment Station.

MARKETING AND PRICES

David A. Storey

Adjustments Needed in Marketing Northeastern Poultry Products
(Hatch Project No. 183)

A survey of egg marketing firms was completed. A publication describing the current egg marketing systems in New England is being prepared in cooperation with NEM-21 representatives from the University of New Hampshire. With the assistance of Arthur Kilbourn, a case study is currently in progress which will evaluate the usefulness of egg marketing contracts in coordinating the production and marketing of eggs. In cooperation with the entire NEM-21 committee a linear programming model is being developed to evaluate alternative marketing systems for eggs in the Northeast.

Marketing of Seafood and Industrial Fishery Products
(Hatch Project No. 268)

With the assistance of Edward Krebs, a study to evaluate factors related to purchases of three species of fish based on a cross-section sample of consumers has been completed. A publication is being prepared. A follow-up study will be conducted this coming year with the help of Harry Gaede. Bob Lee will assist in another study designed to measure the short-run price elasticities and cross elasticities demand for selected species of fish.

Marketing Schemes for Products Produced on Federal Land Development Projects in Malaysia

Bradford D. Crossmon

With the aid of Alladin Hashim, a study is being conducted to determine the marketing alternatives available for various crops which can be produced on the land development projects of Malaysia. The current procedure on the project is to produce an oil palm or rubber crop as a major crop on each farm. However, there is a developmental lag from six to eight years before the major crops come into production. During this period of time there are alternative crops which can be produced and marketed to help support the settlers. This project is examining the economic feasibility of the various alternative crops available to the settlers. The project was made possible by an Agricultural Development Council Grant.

Milk Hauling Rates in the Massachusetts-Rhode Island Order in 1965

Bradford D. Crossmon and Sargent Russell

With the aid of Charles G. Simmons, a study of milk hauling rates in the Massachusetts-Rhode Island Order has been completed analyzing the data furnished by the Milk Administrator's Office for March 1965. This study demonstrates that many inconsistencies in the rates charged exist. There seems to be little consistency in rate per mile or rate by volume as distance in volume shipped changes. The results of this study led to a more intensive study which is described below.

The Cost Structure of Wholesale Florist Crops

Bradford D. Crossmon and Elmar Jarvesoo

With the aid of Peter W. Larson, a study is being completed which will describe the general nature of the wholesale florist routes being operated by florists in the State of Massachusetts. In addition, specific cost functions will be developed for the various types and sizes of operations which are currently found in the industry. This study will help the firms and the industry determine which parts of their current route structure are profitable and which parts are currently uneconomic. It will be completed in the summer of 1967.

Milk Hauling Rates for Direct Farm to City Producers

Sargent Russell

This study of milk hauling rates followed up on the study previously mentioned and included milk hauling data for 1966 as well as that of 1965. The relationship of the hauling rates between the two years was examined. Inconsistencies again appeared relative to rate-distance and rate-volume relationships. This study raised several important hypotheses which will be tested in further work. The Milk Administrator's Office cooperated in this study and has agreed to continue to supply the department with information each year.

Long Run Demand for Apples

Sargent Russell

With the aid of Hsing Tao, a study is being conducted to determine the long run demand relationships for apples. Factors which affect the demand for apples will be quantified and then tested in three models: a static single equation model, a static simultaneous equation model, and a dynamic simultaneous equation model. The results of this study will provide a helpful guide for apple producers in determining the expectations of the future apple market.

The Economics of Production and Marketing of Massachusetts Carnations

Elmar Jarvesoo

The first phase of this study was completed and the results of a Cobb-Douglas type of production function applied to the carnation industry submitted for publication. The second phase of the investigation is now underway which will deal with the cost function of greenhouse carnation production. Cooperation with a floricultural specialist and the three regional horticultural specialists is being maintained on studying the economic aspects of the production and marketing in floriculture.

Food Marketing in Mexico

John H. Foster

With the aid of Alan Palm, a general study of the food marketing and distribution in Mexico is being completed. This study is primarily descriptive in nature, giving basic background information on the distribution channels and marketing channels for food from the farm to the retail outlets.

Marketing of Fresh Fruits and Vegetables to Private Hospitals

Robert A. Fitzpatrick

The first phase of this study which dealt with processed fruits and vegetables was completed and the publication was written. The second phase dealing with the marketing of fresh fruits and vegetables is currently underway. The study will demonstrate the market channels used in obtaining the fruits and vegetables and the importance of this sector of the market to the producer.

Use of the Commodity Market for Hedging for Potato Producers in Massachusetts

Earl I. Fuller

With the aid of Louis Klimoski, a study is being conducted to determine optimum strategies which can be used by potato producers for hedging on the commodity market. A simulation model has been developed to test an alternative which may be available to potato producers. The results of this study should be most interesting to producers who wish to maximize revenue over time in the production of potatoes.

FARM MANAGEMENT AND PRODUCTION ECONOMICS

Feed Handling on Dairy Farms

Earl I. Fuller

Hatch 46 contribution to NE-43R is about to be closed out. This project

has been most productive in terms of two regional publications and may well yield some station publications which will involve delving deeper into the methodology utilized by the regional project. This station wrote the computer programs and actually did most of the analysis of the labor data used as a basis for the regional publications.

Accounting Data as Inputs for Linear Programming

Earl I. Fuller

With the aid of Toshiro, Matsuda, alternative farm accounting systems are being examined relative to their characteristics to provide input data for linear programming. An optimum accounting system will be developed to provide the information that is necessary for linear programming solutions to farm management problems.

A Case Study in Linear Programming

Bradford D. Crossmon and Earl I. Fuller

With the aid of Bob Sturtevant, a case study was made of the Sturtevant farm operations which is a complex operation including egg production, egg wholesaling, breeder flock production, and general cropping. The entire operation was analyzed relative to determining the optimum size and combination of enterprises on the farm. Many of the input coefficients which were developed in this project will be made available for general extension training and particularly the development of a poultry management game.

Optimum Town Tree Management

Bradford D. Crossmon

With the aid of Peter W. Stanley, a study designed to develop optimum tree planting and selection schemes for towns in Massachusetts is being conducted. A system using both biological and economic data will be developed to aid town tree wardens in developing optimum planting programs.

Factors Affecting the Development Patterns of Dairy Farmers in Massachusetts

Sargent Russell

With the aid of Neil Pelsue, dairy operations have been intensively studied to determine what factors affect farmers' decisions in increasing, decreasing or quitting the dairy business. It is being found that many of the decision criterion are not necessarily connected with economic rational. The age of operator, size of family, age distribution of family, level of operator's education, and many other non-economic factors are important in the decision criteria. This study is nearing completion.

The Economics of Fertilizer Placement as a Factor Production in Developing Countries

Sargent Russell

With the aid of Divakar Chandran, production functions for various grain crops handled with various production and fertilization practices are being developed. When this information is available, it is intended to introduce another variable, placement of the fertilizer, into the production functions to determine its effect and whether it is economically feasible to introduce fertilizer placement as an additional factor of production. This information is being developed relative to the developing countries of the world and will have application to our Malawi program as well as other developing areas.

FOOD DISTRIBUTION

Relationship of Shelf Space to Sales of Dairy Products

Theodore W. Leed

With the aid of Edward Johnston, a study is being conducted to determine the effect of shelf space and placement upon the sales of selected dairy products. This project is being conducted in several other areas of the country and is supported by the American Dairy Association grant. The data has all been collected and is currently being analyzed. It is expected that it will be completed by September 1, 1967.

The Effect of Consumer Packaging of Meat in Retail Stores

Theodore W. Leed

With the aid of Bruce Peters, a study will be made of retail meat packaging and its effect on sales, quality of the product, and consumer purchases. This will be an in-store study with data collection beginning in the summer of 1967.

TRANSPORTATION

The Effect of Rate Changes on a Competitive Position of New England Agriculture

Alfred A. Brown

The general research program has been concerned with structural relationships; e.g., the impact of the mileage rates on the New England-Virginia competitive balance and with the level of rates. In the latter context cost determination is a major consideration and appropriate measures of cost are being examined with allowances for interruptions due to demands caused by revisions. Cost analysis and the preparation of a manuscript are continuing.

Transportation Alternatives in Food Distribution

Theodore W. Leed and Alfred A. Brown

With the aid of James Morton, a study was conducted examining the costs of alternative transportation methods available to wholesale food distribution firms. Owned equipment, leased equipment, and for-hire equipment alternatives were examined. A publication will soon be forthcoming.

RESOURCE ECONOMICS

Relationship of Private and Public Recreational Development

John H. Foster

With the aid of Jamie Angus, a study is underway to determine the relationship of private and public outdoor recreational developments in Western Massachusetts. All recreational developments will be determined and analyzed relative to their characteristics. A second phase of the project will be conducted with the aid of Don McClelland to develop criteria for public agencies in making decisions for investment in additional outdoor recreational facilities. This criteria will be developed on the basis of the relationship of public and private recreation and the total demand of society.

Financing Rural-Urban Change

James W. Callahan

The study is concerned with the changing impact of local government receipts and expenditures on urbanization and population growth that occurs within rural communities. The initial phase of assembling data is nearly complete. Seventeen categories of receipts and thirty-five categories of expenditures are being tabulated for 82 towns having populations of 10,000 or more. It is hoped that the data for 1965 will become available in time to be included in this study.

Urbanization and Land Use Change in Massachusetts

Deane Lee

This project is investigating the relationship of changes in agriculture to changes in the population of the State of Massachusetts. Certain relationships have been found to exist which may make it possible to predict change in the future. This project is nearing completion.

MISCELLANEOUS RESEARCH

Credit Costs in Lumber Distribution Industry

John H. Bragg

With the aid of Don Haan, a study to determine the existing credit

practices and credit costs of retail lumber and building materials firms is being conducted. The industry has indicated that accounts receivable pose one of the most serious problems in their business management. Thie study will help determine an optimum credit policy for lumber and building materials retail firms.

Soviet Livestock Industry

Elmar Jarvesoo

Dr. Jarvesoo is conducting a study of the Soviet livestock industry and its development in conjunction with work started on his Fulbright Lectureship in Finland last semester. This study will be completed during the coming year.

DEPARTMENT OF AGRICULTURAL ENGINEERING

J. T. Clayton, Head

Significant research in the area of Agricultural Engineering, Biological Environment Engineering, and Biological Process Engineering was continued. Seven out of a total of eleven faculty members are actively engaged in formal research. Four staff members have primary responsibilities for research and the guidance of 14 graduate students (10 M.S. and 4 Ph.D.)

AGRICULTURAL ENGINEERING

Mechanization of Apple Harvesting
(Hatch Project No. 265, NE-54)

L. F. Whitney

A harvesting aid has been designed, constructed and tested for conventionally grown McIntosh trees situated on typically sloping New England terrain. The machine is based on a telescoping platform. Platforms with built-in telescoping conveyors and padded drop chutes have been fixed at the six and twelve-foot levels. Slope compensation and road leveling features have been incorporated and found to function satisfactorily. One module of an eight module machine has been tested.

Statistical analysis of bruising indicates that effective control is possible. Harvesting efficiencies of poor hand pickers was improved with less fatigue for all pickers. Fruit can be field graded for greater efficiency in the use of complex and costly storage facilities.

This is the only research activity in New England contributing to a Northeast Regional Research project. Mechanization seems to be the only method of augmenting the dwindling labor supply so that the production of fresh market apples can be continued in New England.

Subsurface Irrigation-Nozzle Design and Spacing
(Water Resources Research Center Project WR-15)

L. F. Whitney

Irrigation of crops and turf areas consumes 141 billion gallons of water daily in the United States. Subsurface irrigation is a proved means to reduce water usage up to 40%. However, the success of such systems lies in a long life, economically feasible orifice. Thus far, a satisfactory orifice has not been developed despite research efforts at several experiment stations.

As a result of studies at the University of Massachusetts, orifices formed in plastic pipe walls have been found to be completely unreliable and unacceptable. The inherent "memory" of plastic material results in erratic and unstable orifice formation as determined by statistical analysis of flow rate data and optical observations. Under these conditions uniform distribution of water is impossible due to external

plugging by soil particles. The problem is compounded when the orifice is buried in soil. Labyrinthian protection has been found to improve the flow rate and water distribution characteristics of orifices.

A design study has culminated with a small molded plastic insert which: (1) protrudes into the plastic pipe, thereby reducing internal clogging from water impurities, (2) embodies a labyrinthian protection of the orifice against external plugging from soil particles or roots, and (3) provides a replicable orifice affording uniform water distribution. Initial laboratory results of prototypes are positive and a pilot installation of 1,000 mass produced nozzles is in progress.

BIOLOGICAL ENVIRONMENT ENGINEERING

Simulation as a Means of Investigating the Thermal Exchange of Chickens
(Hatch Project No. 146, NE-8)

J. T. Clayton

Surface temperatures of chickens at various surface locations are being monitored in an effort to gain more insight into the role that convection plays in a chicken's heat exchange with its surroundings. The primary variables are ambient temperature (45°F. to 95°F.) and air velocity (0 to 1600 fpm).

The data are being analyzed primarily in terms of temperature differences. The differences between surface temperatures and the temperatures of the enveloping air are the most significant. At moderate temperatures this temperature difference decreases as air velocity is increased to about 1,000 feet per minute. Beyond this velocity region temperature differences follow no particular pattern. The reason for this is that at the higher velocities the normal configuration of the chicken's feather coat is disturbed (i.e., "wind blown"), thus changing drastically the coat's insulating characteristics.

Since the enclosure to which the chicken radiates is at the same temperature level as the fluid surrounding the bird, it is known that radiation heat loss from the bird is decreasing. Estimations of the convection heat transfer coefficient indicate that convection heat loss increases rapidly. Through a parallel heat exchange process involving both convection and radiation, convection predominates and radiation becomes quite small at high air velocities.

The feathered regions of the breast and sides of the chicken have been the most consistent in showing a gradual decrease in temperature difference. Surfaces about the head, however, have reacted more dramatically to the increase in air velocity, showing sharp decreases between 0 and 500 fpm. These areas, of course, are not feathered and are apparently much more sensitive to changes in the environment. Orientation of the animal with respect to the air stream seems to noticeably affect only the head regions temperatures. Minor orientation effects were noted on the feathered surface, however.

Chemical and Nonchemical Measures for the Protection of Perishable Food Commodities in Marketing Channels
(Hatch Project No. 260, NEM-33)

E. A. Johnson

Additional tests were run to further evaluate the response of Periplaneta Americana to electro-magnetic radiation. The results of these tests correlate closely with electro-retinogram studies in the range of visible radiation. In addition, the tests indicated a high degree of sensitivity in the ultra-violet region. The insects exhibited individual differences in response but it appears that the use of fluorescent ultra-violet light sources might provide an effective means of repelling cockroaches from food handling areas where the use of chemical insecticides and repellents might be undesirable.

Preliminary tests have shown that cockroaches are sensitive to electro-magnetic force fields. The exact nature of their response and the possible use of this knowledge in control applications have not yet been defined.

Closed Systems for Animal Sewage Treatment
(Water Resources Research Center Project WR-9)

J. T. Clayton

Evaluations of two combined aerobic-anaerobic biological treatment systems which show promise of providing satisfactory methods for reducing the pollution potential of animal manure have been continued. Both systems have been found to be capable of reducing the BOD of dairy manure by at least 95% (from more than 3,000 mg/l to less than 150 mg/l).

Two preliminary tests and one long term test of the two systems were reported in a paper presented in May 1966 at the National Symposium on the management of farm animal wastes. This information, enlarged upon and updated, was published in October 1966 in the Proceedings of the Symposium.

Originally one of the treatment systems, System A, consisted of a primary anaerobic decomposition component followed by an aerobic decomposition component. In the second system, System B, the order of the treatment components was reversed.

For a series of tests presently underway, each of the two systems has been modified by the addition of a sedimentation tank following the second treatment component. The purpose of this third chamber is to allow nondegradable solids to settle out, an action which tends to reduce both the solids content and the BOD of the final effluent. The "sludge" accumulated in the final settling tanks is returned periodically to the aeration chambers. In two additional systems under test the final effluent is used as the liquid (transport medium) to mix with manure to form the slurry which makes up the process loadings. This procedure is intended to simulate the "re-use" of the system transport medium and nearly eliminate the need for "new" water.

Trickling Filters - Dairy Manure Stabilization Components

J. T. Clayton

Peformance tests of three identical trickling filters as manure stabilization components under different temperature and process loading regumes have been completed. BOD determinations indicate that almost any desired quality of effluent can be secured by appropriate selection of the operating temperature and/or the process loading rate. A "topograph" showing the design relationship between process loading rate and operating temperature has been developed.

Near the end of these experiments the correlation between volatile acids content and BOD content of the unprocessed manure was tested. Linear regression techniques applied to 22 pairs of data yielded a highly significant correlation coefficient of 0.858. The conversion equation was found to be $Y = 236 + 1.327X$, in which Y is BOD (ppm O_2) and X is volatile acids (ppm acetic acid). This relationship may prove useful in maintaining uniform process loadings in future experiments.

BIOLOGICAL PROCESS ENGINEERING

Heat and Mass Transfer Studies in Food Engineering
(Hatch Project No. 218, NEM-27)

J. W. Zahradnik

PART I. A series of experiments were made to investigate the residence time distribution of a Votator pilot plant by using sucrose solutions as a tracer material. The series included duplicate runs of three flow rates (113, 192 and 286 pph) and four mutator speeds (262, 347, 583 and 1,082 rpm) for the temperature range of 68°F. at the inlet and 188°F. at the outlet of the heating Votator. Based on the residence time distributions, established by the sucrose solution tracer, a computer program was developed to compute the fraction of cells surviving at the outlet of each section of the Votator pilot plant for a micro-organism (Salmonella senftenberg 775W, z = 11.2°F/log cycle of time in minutes).

Statistical analysis showed that: (1) the flow rate had a highly significant effect on the fraction of cells surviving; (2) the mutator speed had a highly significant effect on the fraction of cells surviving; and (3) the linear regression line was inadequate to describe the relationship between the fraction of cells surviving and the flow rates or the mutator speeds.

At running conditions of: 68°F. inlet and 188°F. outlet of the Votator heating section, 113 pph of Salmonella senftenberg 775W cell suspension; and 262 rpm, there was no survival observed at the outlet of each section of the Votator pilot plant.

The computer prediction, under the running conditions for biological processing, was that the fraction of cells surviving at the outlet of the heating Votator would be 1.0×10^{-12} survivors/ml., if the concentration of cell suspension before processing was 1 cell/ml. In other words, the computer predicted that 1 container (No. 2 can, for example,

307 x 409) out of 1.9×10^9 containers would remain contaminated under these processing conditions with this micro-organism.

Previous work has shown that an increase in the mutator speed (rpm) results in a better heat transfer for the Votator heat exchanger so that a higher efficiency for the processing would be expected. However, these studies reported here show that an increase in the mutator speed (rpm) also results in a broadening of the residence time distribution, and consequently the fraction of cells surviving is likewise increased.

A reliable prediction of the public health safety of the process must not only consider the time temperature profile and the kinetics of heat inactivation of the organism of concern but also the residence time distribution characteristics of the processing system.

PART II. The variables of flowrate, temperature and relative humidity affecting the rate of absorption of CO_2 and $Ca(OH)_2$ were evaluated in a small scale reactor or model system consisting of one 50 lb. bag of hydrated lime.

A larger size reactor or prototype consisting of 27 bags of hydrated lime was built on the scale up of two heterogeneous reactors whose equivalent diameters were in the ratio λ; the scale factor for the rate of CO_2 absorption between the two systems was found by experiment.

The results for the model system showed:

1. The effect of flowrate on the rate of CO_2 absorption was significant; a flowrate of 720 cu.ft./hr. was found to give the optimum rate of CO_2 absorption. This furnished a space velocity around the dry lime bag of $\frac{\text{5 cu.ft./min.}}{\text{cu.ft. of void space}}$.
2. The effect of temperature was found to be significant in the range investigated (30° to 90°F.); the highest rate of CO2 absorption was obtained at 90°F.

3. The effect of the relative humidity of the feed gas upon the rate of CO_2 absorption was to increase the rate at the lower relative humidities.

The results for the prototype system showed:

1. The scale factor for the rate of CO_2 absorption between the model and the prototype was found on the order of λ^3. This would indicate that there were no scale effects found between the two systems that would significantly affect the rate.

2. The sizing of CO_2 absorbers based on the highest rate of CO_2 absorption and several other intermediate rates to take care of the peak amount of CO_2 produced by the apples was explored. A comparison was made between the design of conventional CO_2 absorbers based on the overall amount of CO_2 absorbed by one 50 lb. bag of dry lime and the design of CO_2 absorbers based on the highest rate of CO_2 absorption. From these comparisons it is evident that the size of the CO_2 absorber is determined by its rate characteristics

and not only by the equilibrium amount of CO_2 absorbed by the hydrated lime. These comparisons show that the size of CO_2 absorbers can be reduced by over 80% when the sizing is based on the rate of CO_2 absorption. However, the total amount of dry lime requirements for an entire storage season does not change from the total amounts calculated on an equilibrium basis.

High Temperature - Short Time Drying of Fluidized Forage (Hatch Project No. 190, NE-13)

L. F. Whitney

Velocity requirements for the fluidization drying of forage particles are complex, requiring a negatively divergent velocity field. The problem is compounded because of the water vapor release from the drying product. Divergence studies have been conducted as a prelude to the design of drying stages for the fluidization drying process, one which possesses the necessary high capacity and low equipment cost for economical dehydration of agricultural materials.

Two concurrent approaches have been taken. Water vapor release from a product has been simulated by direct water injection at finite locations along a vertical drying tower with air temperatures ranging up to 1,000°F. Theoretical analysis of the velocity divergence has been verified by data analyses using finite difference methods.

Equipment for a multi-stage drying process with air temperature up to 1,000°F. was constructed. In this system the effects of moisture release from a drying product on velocity divergence was studied. The pilot scale stages required small particle sizes - in this case finely chopped lawn clippings. Velocity measurements of drying media with fluidized particles cannot be made by conventional methods. A powder injection technique was devised in which light interruption signals from photo-voltaic cells was employed. Both approaches have been completed and are undergoing analysis.

Food Product Packaging and Handling Systems

S. W. Fletcher

A statistical analysis was completed on the experimental data previously acquired through simulated handling procedures on twelve different methods of containerizing canned foods. These showed that several proposed containers, such as overwrapped tray-packs, gave substantially the same protection against damage as the existing standard method of handling in regular slotted cartons.

A similar objective study of protection from handling damage was performed for thirteen different types of soft goods containers. The raw data have been accumulated and are in the process of being statistically analyzed. Preliminary results indicate that overwrapped trays, end opening cartons, and corrugated sleeve wrap containers have outstanding possibilities for protecting foods at lower cost.

Both phases of these experiments provide the basic test data required by the Association of American Railroads and other carriers before they will accept the damage prevention ability of any new container on an unrestricted basis. The basic advantage to the food industry lies in the reduced handling cost on the retail level that these containers will provide.

CRANBERRY EXPERIMENT STATION

Chester E. Cross, Head

Research programs, both basic and applied, continue vigorous and productive. State matching funds were authorized in support for the proposed new pesticide research facility, and during the year construction plans were nearly completed. Grant support for fundamental studies was awarded from both NSF, PHS, and NIH, and numerous lesser grants were received in support of applied research. Six faculty members, two post-doctoral fellows, and three graduate students made contributions to the research and extension programs.

PLANT PHYSIOLOGY

Robert M. Devlin

Growth Regulators and Fruit Set, Yield and Berry Size in Cranberries

The inducement of parthenocarpic fruit development on cranberry vines (V. macrocarpon) has been successfully achieved with applications of gibberellic acid (GA). In one series of tests the percentage of fruit set was more than trebled by all concentrations of GA applied, and yield by weight was approximately doubled.

A small increase in cranberry fruit set and yield has been demonstrated with the use of a new compound still referred to by its code number (SD-8339). The compound SD-8339 is a kinetin analog. Since this compound is active in very low concentrations and has no adverse influence on vine development, it may be of value to cranberry growers.

Chemical Inducement of Anthocyanins in Cranberries

Pigmentation of cranberries is considerably enhanced by preharvest applications of IAA, silvex and malathion and slightly retarded by GA. Fall and spring applications of Dichlobenil caused more than a 50% increase in anthocyanin development in stored cranberries. Spring applications were more effective in this respect than fall applications.

Effects of Delayed Harvest and Storage on the Pigmentation of Cranberries

It was determined that a short delay in harvest considerably increases the quantity of cocktail quality fruit available for immediate handling when delivered to the processing plant. Anthocyanin development proceeds much more rapidly in berries on the vines than in berries put in common storage for the same period of time.

Plant Growth Regulators and the Uptake and Toxic Efficiency of Herbicides

The data accumulated demonstrate that treatment of redtop grass with IAA or GA increases its sensitivity to simazine. It is hypothesized

that the IAA- or GA-stimulated sensitivity of redtop grass to simazine is caused by an increase in the uptake and translocation of simazine.

Weed Control in Cranberries

Several new herbicides were evaluated. A combination of atrazine and caparol was found to be effective in the control of nutgrass. No damage to cranberry vines by this combination could be seen.

PESTICIDE INVESTIGATIONS

C. W. Miller

Persistence, Concentration and Degradation of Pesticidal Chemicals

Currently approved pesticide compounds are retained primarily in the upper four inches of the soil. The chlorinated hydrocarbon, Dieldrin, is highly persistent and repeated applications show increased residues in the soil. The herbicide, Dichlobenil, is not as persistent, and is rapidly lost from treated areas. Experiments showed that water applied through overhead sprinklers lengthens the period of biological activity of Dichlobenil by 30 days, and chemical analysis demonstrated a twofold increase in soil concentration of the compound as a result of this treatment. The interaction of Dichlobenil and soil micro-organisms in relation to degradation is presently being investigated.

Pesticide Pollution of Aquatic Environments

Investigations showed that draining flood waters can transport pesticidals chemicals from the bog to associated waters. In addition, faulty flood gates allow impounded irrigation waters to seep from the bog and pose a possible pollution problem. It is impossible to avoid deposition of pesticides into irrigation waters when chemicals are applied by helicopter or through sprinklers. Methods to reduce environmental hazards have been advanced. A monitoring program of estuarian waters and associated organisms is presently underway in cooperation with the Massachusetts Division of Marine Fisheries.

AGRICULTURAL ENGINEERING

John S. Norton

Bulk Storage of Cranberries

A three-month test with 600 barrels of fruit proved that quality comparable to that of berries stored in bushel boxes could be maintained in 25 bushel boxes only when provided with forced ventilation. The problem remains to design a practical method or device for doing this.

Bulk Harvesting of Cranberries

Picking into 300 pound containers carried on the picking machine resulted in a 25% reduction in picking time as compared to that required when using conventional (35 pound) containers.

Sprinkler Irrigation Equipment

In addition to providing fully satisfactory frost and drought protection, low-gallonage sprinklers proved to be excellent devices for spreading insecticides and fungicides. Spread in this way the chemicals were as effective as custom aircraft applications at a saving of $3.00 per acre per application.

Experimental Picking Machine

Plans are nearly complete and construction is in progress for a machine that will harvest dry cranberries more efficiently and faster (per machine) than current models. Possibly 20% of the dry harvested Massachusetts cranberry crop is lost in the picking operation, and harvest labor continues as a serious problem.

Water-Harvesting of Cranberries

Increased interest in water-harvesting has resulted from an established stable market with profit-level prices, the reduced need for dry fresh fruit, the acceptability of wet clean fruit to the major handler, and the desirability of reducing the 10% to 25% losses of dry harvesting. Equipment for elevating and cleaning the floating berries from the bog to bulk delivery trucks was designed, constructed and tested in preliminary trials.

Storage of Cranberries in Ozone

Preliminary tests showed that an ozone atmosphere does not increase storage life of cranberries at 40°F. and drastically reduces it at 60°F.

Water Resources Research Center Project (WR-5)

Plastic, aluminum and aluminum-core earth dikes are under construction to subdivide into small units the flooding areas of cranberry bogs to facilitate "water-harvesting" of the crop with limited but reusable water supplies.

ENTOMOLOGY

William E. Tomlinson

Life History of Cranberry Fruitworm

Lack of consistent mating of confined cranberry fruitworm moths has hampered laboratory rearing of this species. Studies indicate that temperature, wave length and intensity of light, combined with an unknown plant stimulus of cranberry or blueberry, regulate the mating response. This knowledge is a necessary prerequisite to laboratory studies of sex attractant, radiological and chemosterilant control investigations.

Methods of Timing Fruitworm Controls

Black-light collection records of cranberry fruitworm moths were found to show egg laying activity with sufficient accuracy to use them for timing of chemical controls, obviating the need for time consuming berry sampling and egg counts.

Cultural and Chemical Controls and Effects on Parasites

The study of the effects of flooding and spraying practices on parasites of the cranberry fruitworm is continuing in an attempt to integrate natural and artificial control practices to the best advantage and to discover insecticides less damaging to the parasite complex than those presently recommended.

Tests of New Insecticides

Evaluation of new insecticides against cranberry fruitworm, cranberry tipworm and *Sparganothis sulfurana* showed Vapona, Gardona, G.S. 13005 and Dursban to be as effective as parathion with the advantage of lower mammalian toxicity. This is desirable with many growers applying insecticides through sprinkler systems.

EXPERIMENTAL BIOLOGY

B. M. Zuckerman

Microbe-Nematode Interactions in Degrading Pesticides

To define the metabolic paths of degradation of organophosphate insecticides due to activities of micro-organisms. Primary results to date - several metabolites elucidated and a good indication that micro-organisms react symbiotically in degrading pesticides.

Degradation of Pesticides in Water and Plants

Use of controlled environment systems in studying pesticide translocation and interactions. Through use of these methods we have found that plant enzymes do not rapidly metabolize organophosphate insecticides. Also, the pristine pesticide molecules are distributed rapidly, but evenly, throughout the plant when applied to soil, and can be detected in root exudates one-half hour after application to leaves.

Ectoparasitic Nematodes as Incitants of Plant Diseases

Ectoparasitic nematodes have been defined into two groups: primary pathogens and secondary pathogens on the basis of experiments carried out in gnotobiotic culture.

Nematode Nutrition

Attempts to propagate a metazoan on a chemically defined medium. Limited growth and reproduction has been achieved. Outlook for success problematical but the rewards tremendous.

Color Enhancement of Cranberries

Preliminary studies show that several chemicals promote anthocyanin development in cranberries.

Physiology of Nematodes

Elucidation of enzyme systems in ectoparasitic nematodes and histochemical localization of sites of activity. Also, studies on monoxenic culture continuing. Results given in two published reports during the past year.

Microbial Degradation of Diazinon

Studies continue on defining degradative pathways of this insecticide.

Cranberry Disease Studies

Control devised for red-gall disease. Continuing studies on control of fairy ring and fungicide screening.

DEPARTMENT OF ENTOMOLOGY AND PLANT PATHOLOGY

Malcolm A. McKenzie, Acting Head

PLANT VIROLOGY

George N. Agrios

Indexing and Transmission of Pome Fruit Viruses

Transmission experiments with known and with suspected apple and pear viruses are being carried out in the orchard, nursery and greenhouse. Several apple stock trees used as budwood sources by commercial fruit tree nurseries have been shown to be infected with viruses and are being replaced as budwood sources with virus-free trees.

Foliage symptoms of fruit russet ring and leaf flecking virus have been transmitted by grafting to apple trees in the field and in the greenhouse. Transmission of fruit symptoms and mechanical transmission of the virus are presently being studied.

An apparently new virus or virus strain causing stunting and decline of Spy 227 and decline, dieback and death of apple clone R12740-7A trees has been transmitted from commercial Cortland trees. The symptoms induced by this virus on clone R12740-7A are distinctly different from those caused by any other known apple virus. Host range and symptomatology of the virus are being studied to determine the identity and effects of the virus on commercial varieties.

Effect of Viruses on Pome Fruit Development and Storage

Considerably greater defoliation and premature fruit drop at harvest was exhibited by apple mosaic virus-infected than virus-free apple trees. Virus-infected apples were 12% smaller and had fewer seeds than healthy apples. There was a greater percentage of misshapen fruit among AMV-infected (27%) than among healthy (10%) apples. Periodical fruit pressure measurements showed no significant differences in firmness between virus-infected and virus-free apples. Thirty-two per cent of AMV-infected apples and 86% of russet ring virus-infected apples decayed after nine months in cold storage as compared to 30% of virus-free apples of the same variety which decayed in the same period. The mechanisms by which viruses so affect the physiology of the fruit are being studied.

Effect of Virus Infections on Susceptibility of Plants to Fungi

Studies of virus-fungus interrelationships suggest that the differential growth of certain apple pathogenic fungi on extracts from healthy and from virus-infected apple tissues may be affected by the fungus isolate and by the concentration of the extract in the culture medium. Virus-infected and healthy apple seedlings are inoculated with pathogenic fungi to measure the frequency and severity of fungal infections on healthy

and virus-infected plants. Healthy and virus-infected fruit will also be inoculated with fungi and then be kept in storage to determine the relative amounts of fungal infection on the two sets of fruit.

Net- and Ring-Like Cracking of Pear Fruit

Severe cracking was found on five to 100% of the fruit on trees of several pear varieties. Cracking varies with the variety and appears in early July or late August as long , isolated cracks or as many shallow or deep cracks arranged in networks or rings on the pear surface. Cracked fruit remain small and, on some varieties, they become deformed. Affected trees produce little or no fruit the following year. No fungi or bacteria could be isolated from cracked fruit. The involvement of viruses in this disease is suspected and is studied through transmission experiments.

Viruses and Virus Diseases of Forest Hardwoods

Attempts to transmit virus symptoms from declining maple trees have been continued in the field and greenhouse through grafting and sap inoculations. Virus-like symptoms were obtained on two herbaceous hosts in two separate experiments but their reproduction has not been possible as yet.

Some ash trees exhibiting dieback were found to show symptoms of what appears to be tomato ring-spot virus and there are indications that this virus is widely distributed on ash. Observations on diseased trees of these and other forest hardwood species showing virus-like symptoms are presently being made and transmission experiments are underway to determine the presence, identity and effect of viruses on them.

FRUIT TREE PATHOLOGY

Blister Canker of Pear

George N. Agrios and Gregoria N. Acedo

A severe disease of pear appearing as numerous blisters on the bark has been found in two orchards in Massachusetts. Affected trees produce fewer and smaller leaves. Terminal growth is smaller and fruit production is reduced. Finally, trees decline, heavily infected twigs and branches die, and sometimes entire trees are killed. The fungus *Helminthosporium* has been isolated from diseased trees and, upon inoculation, it reproduced the disease on pear seedlings in the greenhouse. Histopathological studies indicate that the fungus is restricted to the bark where it induces a vigorous histological response by the host. Culture filtrates of the fungus exhibit a strong toxin-like effect on young, excised pear twigs and leaves. Sporulation, mechanism of infection, toxin production and susceptibility of fungus cultures to fungicides are presently being investigated.

Etiology of Sugar Maple Decline

Walter M. Banfield

It has been demonstrated in repeated trials with potted greenhouse sugar maples that the progressive marginal scorch of leaves, defoliation, and dieback disease syndrome of sugar maple decline can be induced at will by prolonged withholding of water. Timely applications of water to selected field trees has uniformly arrested the decline syndrome in these trees in contrast to a continuing degeneration in unwatered control trees. Extensive field observations in New England indicate that decline is habitually associated with environments characterized by high moisture stress, particularly in drought years.

Examination of the root systems of declining sugar maples in the field has disclosed extensive injury and degeneration in these root systems. In pastured swales extensive root damage is done by the feet of cattle sinking into the soft soil in wet periods. Trenching beside roads destroys large segments of the root systems in roadside trees. Few or no roots have been found in the soil beneath the pavement of roadside trees. Degeneration of roots in soils compacted by constant pedestrian or vehicular traffic in towns is associated with adverse environments.

Detailed records of the ecological parameters of declining field trees disclose the following general conditions: higher air flow, higher evapotranspiration, higher soil temperature, lower relative humidity, greater exposure to sunlight, absence of mulch of any kind, and comparatively high bulk density of soil due to soil compaction in contrast to the environments of normal trees in northern hardwood forest communities unchanged by man.

The Association of Insects With Decline of Maples in Massachusetts

William B. Becker

The current widespread decline of field and woodland sugar maple trees in Massachusetts seems intimately associated with: (a) drought, plus (b) some activity of man (forest thinning, soil compaction, etc.). Decline has not yet been found in undisturbed forests here. As in the recent maple "dieback" in Canada, no primary insects have been associated with our current decline.

In absence of such insects here but with realization that they sometimes have been associated with tree declines elsewhere, two types of studies were started: (a) artificial defoliation tests, and (b) observations on effects of a recent natural defoliation in one small stand of sugar maples.

Artificial defoliation has, understandably, caused much more damage to saplings in shaded understory conditions than to saplings in sunny, open conditions. June defoliations caused more damage than August defoliations. Less understandably, artificial defoliation is causing

much more damage to single branches on large seemingly healthy trees than to entire saplings. Observations in the small naturally defoliated plot are too incomplete to evaluate results.

TREE DISEASES AND INSECTS

Pathology of Tree Wilt Diseases
(Hatch Project No. 110, NE-25)

Francis W. Holmes, Malcolm A. McKenzie
and Joseph S. Demaradzki

Resistance by the host tree to the Dutch elm disease fungus continues under study. Seedlings that survived neutron-irradiation as seeds and survived inoculation with *Ceratocystis ulmi* as young trees (ca. 6' height) are transplanted the following spring and receive their second inoculation two years after their first. Instead of seeking utter immunity we retain the most resistant regardless of their symptoms and rogue the rest. These most resistant elms will serve as parents in future crosses once they reach seed bearing age. Crosses on this campus under own control started this year and the number of parental trees involved should increase each year.

Maple Decline
(McIntire-Stennis Project, MS-1)

Francis W. Holmes, R. F. Farrington

Bacteria most frequently isolated from maples with wetwood or decay appear to be in genus *Pseudomonas*. They are short, motile, Gram-negative rods whose fermentative capacities and other characteristics are detailed in Mr. Farrington's M.S. thesis, *Bacteria Isolated From Maples*. Soil in nursery beneath raised, roof-like, plastic watershed became drier progressively compared with soil in nearby check areas as measured with "Irrometers" but a rain of more than three inches in midsummer drenched the whole nursery and washed under the shed from the sides. Maples were inoculated with the bacteria isolated but symptoms and reisolations remain to be sought. Planting too deep clearly injures sugar maples; data are still being taken each year. Trees grow so fast as wholly to fill artificial girdling roots installed in 1966; a revised model has been produced for installation on other maples in 1967.

Study of Fungus and Insect Pests of Trees in Massachusetts

Malcolm A. McKenzie, Francis W. Holmes

Further evaluation (in cooperation with C. S. Chater, Waltham) confirmed ineffectiveness of "Bidrin" against Dutch elm disease under Massachusetts conditions. An 11-page analysis was submitted on 9,556 diagnoses of tree troubles (excluding Dutch elm disease), including 981 performed in 1966. Biopsy and diagnosis continue. Salting of roads and analyses of foliage continue.

ECOLOGICAL INVESTIGATIONS

T. Michael Peters

Research in arthropod ecology continues to accelerate. Five graduate students, two undergraduates, and one faculty member are involved. Increased activity in the research program will be reflected by the addition of three new graduate students as of July 1, 1967.

Environment Manipulation and Mosquito Populations (Hatch Project No. 253)

The phase of environmental resistance to developing mosquito populations currently being studied is the influence of the population and its pollutant action on the environment. Data indicates that biochemical and biological interactions drastically alter the developmental rates of individuals of the same or different mosquito populations maturing in the same environment. Tests are now being conducted to separate, identify, and determine the action of the effective agents. The test animals used are *Culex pipiens* and *Aedes aegypti*.

The biological effects of a vital dye, Nile Blue A, are being investigated. This dye, originally tested as a possible internal tagging material, retards assimilation by mosquito larvae without affecting their metabolic rate.

In unsupported research allied to Hatch Project No. 253, another species, *Anopheles quadrimaculatus*, will be tested for similar biochemical interactions with the two species previously mentioned.

In unsupported research directly allied to Hatch Project No. 253, the influence of physical factors on the dispersal and movement of mosquito larvae is being investigated. Larval movements, especially as affected by physical objects in water, are important to understand before determining population size or appropriate sampling techniques under natural conditions.

The Effect of Increased Environmental CO_2 on Growth and Development of Phytophagous Arthropods

This unsupported study of mite and insect development in response to increased CO_2 concentrations stems from the recent trend in greenhouse management of increasing CO_2 to stimulate greater plant growth. We are attempting to determine what effects this abnormal atmosphere has on the developmental and reproductive capacities of some phytophagous arthropods occurring in greenhouse environments.

Social Aggregations of Exotic Blattids (*Gomphadorina* spp.)

Certain exotic cavernicolous roaches (*Gomphadorina* spp.) exhibit behavior patterns that appear to have rudimentary social functions. These patterns are being studied to determine the sequential stimuli involved in the basic contact relationships, especially those between the adult female and her brood. Secondarily, the aggregation of adults and gregarious stimuli are being investigated.

Taxonomy of Dixidae

This primitive family of Diptera is closely related to the mosquitoes. To date our progress permits us to identify adults from the Nearctic region. We are now starting to associate immature forms with the adults. After describing the immature forms we will be able to investigate the ecological niches of the larvae and make comparative studies of ecological specialization between the dixids and the most primitive mosquitoes.

Problems of Insect Pests of Forage

Frank R. Shaw

The year 1966 marked the termination of Hatch Project No. 139 which involved the general problems of insect pests of forage with emphasis on the alfalfa weevil, and the initiation of a new project, Hatch No. 279, which deals with the role of parasites and predators in the control of the alfalfa weevil.

Two important research contributions were the theses of M. C. Miller entitled "A Study of Certain Factors Influencing Oviposition by the Alfalfa Weevil, *Hypera postica* (Gyll)," and of R. A. Callahan entitled "Comparative Analytical Methods for the Detection of Ronnel or Related Toxic Residues in Chicken Eggs."

We have determined rates of disappearance of several pesticides from alfalfa and have submitted 12 disappearance curves of pesticides for inclusion in the forthcoming bulletin to be published under NE-36.

Considerable time was expended to prepare a summary of the residue investigations on forage and in or on animal products. This was my responsibility as chairman of the subcommittee charged with the investigation of residues on the above products. Such information will be included in the forthcoming NE-36 bulletin.

Taxonomy of Aedine Mosquitoes

Marion E. Smith

Primary emphasis has been placed on two projects: (a) preparation of a key for identification of larvae of New England *Aedes*, including early instars which are not covered in any existing keys - this paper will be submitted for publication during the summer; and (b) a study of a complex of closely related species, from a number of geographic areas, in both larval and adult stages, to ascertain specific standings and relationships of the groups concerned - this study should be completed in the fall.

A graduate student, Duncan W. MacKenzie, has completed a study on the chaetotaxy of the larvae of one species of *Aedes*, finding a clear-cut method for distinguishing second from third instar, a heretofore impossible by any known procedures. He continues his studies with other species of *Aedes* in a comparative morphology of the several larval instars.

DEPARTMENT OF ENVIRONMENTAL SCIENCES

John A. Naegele, Head

Research and teaching by faculty and staff of the Department of Environmental Sciences has continued to expand both in scope and depth. In cooperation with several departments the direction of graduate students and involvement in teaching continues. This year two Ph.D.'s, three master's and a honors B.S., plus the teaching of several courses for other departments, reflect the involvement of our faculty in the academic life of the University. Our faculty have also become involved in the graduate programs of other universities. In particular, we have contributed to the research guidance and success of one Harvard Ph.D. and are involved in cooperative research with U.M.B. The departmental commitment in formal adult education continues in depth with over 300 students enrolled in formal courses centered around environmental problems. Research support from grants and contracts continues to increase reflecting increased productivity and professional competence of the faculty.

FOOD PLANT BIOLOGY

The Cytogenetics, Morphology, and Evolution of Corn and Its Relatives

Walton C. Galinat

Additional data has accumulated which shows differences in the genetic architecture between corn and *Tripsacum* and these differences have some correlation to differences in chromosome structure. The longer chromosomes of corn appear to have their corresponding loci distributed among two or more shorter chromosomes in *Tripsacum*. The long arm of *Tripsacum* chromosome 5 corresponds genetically and cytologically to the short arm of corn chromosome 2. A different and very short *Tripsacum* chromosome has the V_4 locus representing at least part of the long arm of corn chromosome 2. With respect to corn chromosome 4, we have a more complicated situation. The *Tripsacum* chromosome marked by Su_1 on the short arm of corn chromosome 4 does not have the *La* locus which is on the distal end of that arm in corn nor the Gl_3 locus which is on the long arm of the same corn chromosome. Conversely, the *Tripsacum* chromosome which bears the Gl_3 locus of corn does not have the Su_1 locus. Not only are the shorter chromosomes of corn (7 to 10) similar in length and arm ratios to the longer chromosomes of *Tripsacum* (1 to 4) but at least two of the shorter corn chromosomes (7 and 9) have homeologs in *Tripsacum* with similar genetic architecture. That is a single *Tripsacum* chromosome carries at least four loci in common with corn chromosome 7 and another *Tripsacum* chromosome has at least a series of 5 loci found on corn chromosome 9. In addition to a better understanding of evolution of corn and its relatives, these studies may lead to a greater exploitation of intergeneric breeding.

The task of developing all 18 possible addition monosomics of *Tripsacum* chromosomes on corn is underway. A cytological idiogram of the genome of the *Tripsacum* used as well as idiograms for each of the extracted

Tripsacum chromosomes which are under study are being determined. Rotes of corn-Tripsacum crossing over and the phenotypic effects of extracted Tripsacum chromosomes will be studied.

Studies of plant habit and the adaptation of corn to various environments are underway and an experiment station bulletin on the studies to date is in press.

Archaeological maize from certain important geographical areas of the American Southwest has been analyzed and a manuscript on this is in preparation.

Selective Adaptability of Vegetables in Massachusetts

Robert E. Young

Investigation of the yields of dry matter in various varieties of vegetables and the interrelation to quality continued with an evaluation of intra-specific variability as a guide to future manipulation.

The evaluation, testing and development of a new greenhouse tomato, Waltham nema-resistant hybrid, resistant to three serious diseases in our greenhouses in Massachusetts, has been completed. This new variety has good horticultural characteristics equivalent or superior to Waltham disease resistant hybrid and is resistant to Cladisporium leaf mold, Fusarium wilt and root-knot nematodes. Over three acres of the new variety were planted this fall.

Extensive field trials have determined that the addition of carbon dioxide to our variety of tomatoes is of marginal value. Some years there was no increase in yield; others a slight increase in production and percentage of a number one fruit.

The final selection of a new, locally adapted strain of Iceberg lettuce has been completed. Sufficient seed for large scale grower tests has been procured and will be distributed for trials.

Two more generations of backcrosses in a greenhouse and trellis tomato breeding program to incorporate multiple resistance to disease have been completed. These diseases are Tobacco Mosaic virus, root-knot nematode, Verticillium wilt and Fusarium wilt.

The final selections of a new strain of butternut squash that does not produce dimorphic plants or crooked fruit have been made. It has been selected for acceptability in taste, color and long storage.

Of particular interest to our continuing variety development program, we discovered that the Waltham hicolor carrot, developed a few years ago under these projects, has provided Florida with a new agricultural enterprise. There are now 7,000 to 10,000 acres of this carrot being grown yearly.

William A. Feder

Chronic Effects of Air Pollutants

Chronic effects of air pollutants upon two varieties of carnation in ambient air are now being studied using three pairs of mylar chambers in a greenhouse. Every other chamber is equipped with a charcoal filter and air is passed into each chamber under slight positive pressure. The air in the enclosing greenhouse and each chamber is monitored for temperature, carbon dioxide level, and for ozone and sulfur dioxide. The experiment was started in March 1967 but no oxidant was recorded in the ambient air until May 15, 1967. Records are being kept of plant height, vigor, color, and bud and flower formation. To date no differences between plants grown in filtered and non-filtered air has been discerned. It is expected that differences, if any, will appear now that the oxidant level in ambient air has begun to rise.

The Differential Susceptibility of Selected Greenhouse Tomato Varieties to Low Levels of Ozone

Thirty-nine varieties of greenhouse tomatoes were exposed to low levels of ozone for periods of three days. They were indexed for injury and found to fall into three general groups: severe, moderate, and no injury. Injury on susceptible varieties occurred at below 5 PPHM, thus demonstrating that tomatoes are as sensitive as tobacco to ozone. This is the first time that differential susceptibility has been observed in tomato and the information developed in this screening will be used to aid the plant breeder in developing an ozone-resistant tomato for greenhouse use.

The Effects of Light and Dark Predisposition Upon the Susceptibility of Lemna sp. to Ozone Damage

Lemna sp. (duckweed) is being reared in this laboratory under controlled environmental conditions on a known medium. *Lemna* grown in this fashion shows a marked increase in susceptibility to ozone damage when predisposed with a lengthened dark period. There is a measured increase in the lag phase before vegetative reproduction begins and damage to the old fronds is markedly increased. This type of reaction corresponds with similar reactions recorded for tobacco and certain other ozone-sensitive plants and indicates the usefulness of *Lemna* as a possible laboratory tool for studying the effects of ozone upon green plants.

The Effects of Ozone Fumigation Upon the Lipids of Lemna

This work is being carried on in cooperation with Dr. S. Robrish of the University of Massachusetts, Boston. Solvent extraction of the lipids and thin layer chromatographs are being planned to characterize the normal and altered lipids of *Lemna*. In addition, electron microscopy of plastids exposed to ozone are also being prepared in an effort to pinpoint the site of injury.

Haim B. Gunner

Ecology of Soil Microflora and Free Water Incroflora in Response to Organophosphate Insecticides

The organophosphate insecticide, Diazinon, was found to exert a sharply selective effect on the soil microflora. Arthrobacter sp. and Streptomyces sp. were found to be the predominant microflora with the latter the climax population after six months. Studies are presently being conducted to enhance this selective effect for the exclusion of fungal plant pathogens.

Parallel with soil ecological studies are those measuring and identifying changes in the microflora of free water systems receiving organophosphate insecticides. Separate populations are selected by Diazinon and Parathion. Populations selected by Parathion are sensitive to Diazinon applications and serial applications of the two insecticides may impose a wide restriction on important components of the soil microflora.

Biochemistry of Microbial Response to Organophosphate Insecticides

The physiological bases for the selective effect of organophosphates on the soil microflora are being investigated. The influence of Diazinon on the oxidative phosphorylation and carboxyesterase enzyme complements of respective soil species is being investigated in a proposed model system for the differential microbial response to this insecticide.

Microbial Degradation of Organophosphate Insecticides

The capacity of the soil microflora to degrade Diazinon and Parathion is under study. Populations arising in response to these compounds are able to utilize them as respective sources of carbon, nitrogen, phosphorus and sulfur. The specific degradative pathway of Diazinon suggests that the toxic side-chain moiety is susceptive to dissimilation by individual cultures of organisms. However, the ring portion of the molecule, as shown in experiments with isotopically labeled material, required the simultaneous, or synergistic, activity of two populations, the Arthrobacter sp. and the Streptomyces sp. for biodegradation to occur. This would suggest that molecules hitherto considered recalcitrant under the attack of individual pure culture of microorganisms may in fact be biodegradable in nature under the simultaneous attack of two or more populations. Work is presently continuing with more complex population models including microbenematode populations.

Inorganic Transformations by Arthrobacter

The genus Arthrobacter is one of the most ubiquitous and numerous in the soil. Specific attention has been given to its capacity to transform nitrogen to higher or lower oxidation states. Of special significance to the nitrogen economy of the soil is the demonstration that

it is capable of tolerating and utilizing very high concentrations of nitrite. This suggests a competitive role with Nitrobacter for nitrite substrates. Transformation of other inorganic ions by Arthrobacter is now being studied.

Biological Control of Soil-Borne Pathogens

The manipulation of the rhizosphere ecosystem has been successfully employed as a means of reducing Fusarium wilt of carnations. Microbial isolates from carnation rhizosphere capable of lysing Fusarium were reintroduced into pasteurized greenhouse soil. They were maintained as a stable microfloral component and effectively controlled Fusarium even when the cuttings were artificially wounded. Studies of Fusarium blight in Merion bluegrass revealed a biphasic ecological pattern: (1) the restriction of microflora competing with Fusarium through the action of Trichoderma viride; and (2) the enhancement of host susceptibility by water stress. Only at soil moisture levels of 20-40% field capacity, and in the presence of Trichoderma viride did Fusarium infestation occur. The enhancement of lytic action through various organic amendments is presently under study.

The Comparative Biochemistry of the Pleomorphic Forms of Arthrobacter Globiformis 616 Cell Walls

Robert W. Walker

The cell walls of the pleomorphic and the coccoidal form of A. globiformis are being studied in an attempt to determine what the laterations in structure are that cause pleomorphism.

The Lipids of Arthrobacter Globiformis

The lipids of A. globiformis are further being studied to determine the structure of the phospholipids and the effects of environmental regimes upon the amounts of these lipids elaborated.

Determination of Carbohydrate Pathway for Clostridium Botulinum Type A, B, and E by Interval Radiorespirometric Techniques

Warren Litsky, John H. Green, and Ismini George

An interval radiorespirometer consisting of Warburg apparatus, tygon tubing, a peristaltic pump, and simple gas traps was constructed. This was applied to the problem of determining the carbohydrate pathway of young C. botulinum cell cultures of types A, B, and E by detecting the release of $^{14}CO_2$ from specifically labeled carbohydrates. Glucose labeled with ^{14}C in the varying positions of 1, 2, 3-4, and 6 was the primary carbohydrate used. An assay medium and optimal conditions previously described by our laboratory were incorporated into these experiments. CO_2 from the N_2-purged incubation flasks was collected at intervals and precipitated with Ba^{++}; the radioactivity was then determined by a gas-flow Geiger counting system. The results showed that glucose labeled in the 3-4 positions released $^{14}CO_2$, whereas no $^{14}CO_2$ was detected from glucose labeled in the other positions. This indicates that the Emden-Meyerhof-Parnas (EMP) pathway was operative for the C. botulinum strains studied.

Attempts to Distinguish Toxigenic Clostridium Botulinum Type E Employing Single Amino Acid Metabolism

Warren Litsky, Alfred Hoffman, and Ismini George

By use of various strains of toxigenic C. botulinum Types A, B, and E, as well as one strain of a nontoxigenic C. botulinum, it was found that the strains of C. botulinum Type E were unable to metabolize most single amino acids, whereas the other strains were active in metabolizing these compounds. Breakdown of L-cysteine, L-threonine, and L-arginine could not be detected for the toxigenic Type E strains, whereas these three amino acids, among others, were readily metabolized by Types A and B, and the nontoxigenic strain. For this investigation, cells were grown in a medium containing trypticase, peptone, yeast extract, glucose, and sodium thioglycolate at 32 C. The cells were then centrifuged and washed with phosphate buffer (ph 6.8) containing sodium thioglycolate. A thick suspension of cells was added to Warburg flasks which contained amino acid dissolved in phosphate buffer (pH 6.8). Prior to adding the cells to the substrate, the flasks were flushed with nitrogen gas and maintained at 35 C.

Biosynthesis of Hemolysins by Clostridium Chauvoei

Warren Litsky and Thomas C. Boyd

Studies on the biosynthesis of hemolysins by C. chauvoei revealed that hemolysin production, as measured by the tube assay method, paralleled the growth phase. Growth occurred from 24 to 42 C, and between pH 6.0 and 7.5. Optimum was found to be 37 C at pH 7.0. Actively growing cultures, maintained in the log phase by a pH 7 controlled medium, produced significantly elevated levels of hemolysin by the tube assay. In an attempt to characterize the hemolysins, a qualitative assay was devised with the use of electrophoretic separation on cellulose acetate strips which were subsequently developed on thin blood-agar plates. Two hemolysin bands were observed, one relatively fast-moving and actively lytic and the second slow-moving and weakly lytic. Hemolysins were readily detected by electrophoresis in supernatant volumes as low as 1 u liter, whereas the corresponding tube assay method revealed negative results in volumes up to 100 u liters.

Action Spectra and Mass Culture of Photosynthetic Microorganisms

Glen Hemerick

The purpose of these investigations is to develop efficient mechanisms for converting solar energy into two useful products, food and electric power. Theoretically, efficient mechanisms for solar energy conversion occur in certain species of algae which contain photosynthetic pigment systems other than chloroplasts.

The experiments on electric power generation are carried on by Air Force scientists who require large amounts of algae (1-2 K/g/week) containing specific pigments. Regulation of pigment synthesis is the responsibility of the principal investigator.

Experiments on food production also require large amounts of algae of each specie to be tested. A five- ram quail consumes 500 grams dry feed in five weeks, while gaining 100 grams fresh body weight. Large scale production of each specie for electrical power and feeding trials require knowledge of proper conditions for growth, which differs between species. Such knowledge is lacking for the species under investigation, and must be determined experimentally.

Results of studies on dissociation and regeneration of photosynthetic pigments, produced at Waltham, have been released by the Air Force with acknowledgement of the source. Conditions for high growth rate of eight species of algae and bacteria, and for pigment synthesis control have been reported to the Air Force. Conditions for production of 17 species of algae for feeding trials have been determined.

All 17 species have been fed to Japanese quail in amounts ranging from 30 to 100% of the diet. The data on relative growth rate of birds are not regarded as significant, because of small sample size and variability in gains of control birds. The significant results are as follows:

1. Seventeen species of cyanophyta were nontoxic to quail (although cyanophyta are often implicated in algal poisoning of animals).

2. Many of these species appear to be highly productive and economical to grow and harvest.

3. The accessory photosynthetic pigments were less digestible than other cell components, being concentrated in the highly-colored droppings.

AVIAN AND PLANT DISEASE DIAGNOSIS

Isolation and Identification of Plant Disease Agents

Jean A. Snow and Elsie Cox

The advent of new plant diseases, increasing numbers of new and specific treatments for disease, and the present demand for greater and more efficient crop production have made urgent the development of more efficient and positive diagnosis of the causes of disease. To insure that our research and educational programs have a sound base and direction and that the crop growers of Massachusetts achieve maximum production, the Department of Environmental Sciences has instituted the plant disease diagnostic laboratory.

This report lists the crop diseases and causative agents diagnosed for the commercial growers of Massachusetts during 1966 by the Plant Disease Diagnostic Laboratory. *Fusarium oxysporum* and other species of *Fusaria* are the most frequently identified pathogens from floricultural crops. *Botrytis cinerea* is the second most frequent floral infection.

The greatest frequency of parasitic disease in vegetable crops of Massachusetts (1966) was recorded from tomatoes. As in floral crops, infection by the *Fusaria* was the most common problem, strongly indicating the need for emphasis on sanitation for disease control.

The necessity for more research and education in cultural practices is underlined by the frequency percentage of nonparasitic diseases of approximately 34%. (Total diagnoses - 401; total nonparasitic diagnoses - 139).

Isolation and Identification of Avian Disease Agents

George P. Faddoul and Gordon W. Fellows

During the past year a total of 4,674 specimens were submitted for a systematic autopsy and a bacteriologic-virologic examination. A survey which was initiated in 1960 continued throughout the year to determine the frequency of salmonellae in the various avian species submitted for diagnostic investigation. Salmonella organisms comprising 14 different serotypes were identified in the 28 isolations recovered during the past year.

The diagnostic laboratory is cooperating with the Massachusetts Audubon Society in an extensive study of pathogens in wild birds. Emphasis has been directed toward the isolation and identification of pathogens communicable to man and domestic fowl.

ACARINE POPULATION BIOLOGY

Ecological Genetics

John A. Naegele and William D. McEnroe

Concepts developed in population genetics have proven applicable to the study of the development of resistance in the two-spotted mite. The establishment of new physiological races to specific selecting agents in both laboratory and wild strains has indicated the functional significance of the adaptive process for response to a toxicant and the co-adaptive process for fitness and thus resistance stability.

Chromosomal Reliability

William D. McEnroe

The two-spotted spider mite because of its haploid male, diploid female sex mechanism, provides a reliable model system for studying the effect of fitness of the duplication of a chromosomal set. The effects during embryogensis, a period requiring maximum control efficiency, are compared to the effects on life span where cell division is essentially complete and control efficiency is less demanding. These studies indicate an unusually high degree of linear programming in the 1-n set. Embryogensis is more sensitive than adulthood to chromosomal manipulation.

Sensory Physiology

William D. McEnroe

Color vision in the green and near U.V. has been demonstrated. Anatomical and behavioral studies have confined the selective functions of

the receptive system. This animal responds differently to polarized light suggesting an orientation response. The color vision imposes a stereotype behavior response upon this animal.

ORNAMENTAL PLANT BIOLOGY

Carnation Breeding

Franklin J. Campbell

The carnation breeding project this year satisfied its immediate objective of the production of a commercially valuable pink-colored carnation. This clone, after being awarded the coveted Gold Medal award in international competition, was named 'Boston Marathoner'; has reflected favorable publicity for the University of Massachusetts and has been recently turned over to the New England Carnation Growers Association for dissemination. Along with other facts, this clone reflects the accomplishment of a desirable color, high production and size, plus heat tolerant production through selective breeding by the writer and originator. The project proceeds actively and along the lines of plant breeding creativeness to produce new varieties. Resultingly, there are 25 new clones being increased for commercial double potentialities and 20 new clones being increased for miniature potentialities. This year will see approximately 800 new seedlings developed under different cultural conditions to establish truer appraisal methods.

Parental breeding lines have been established not only for future recombination but also for air pollutant studies. Thus, results at this level may establish for the first time the effects of air pollutants on basic breeding material with the potential of breeding general air pollution resistance into new carnation clones. A single recessive gene results in a carnation abnormally termed 'dwarf'. The genetic reaction of these abnormalities is being studied in reference to growth regulators, temperatures and light. In addition to having a better understanding of clonal reactions, the end practical value may be the timed production of a carnation pot plant.

Environmental Adaptability

Franklin J. Campbell

Environmental adaptability and regional receptiveness were studied for 175 different varieties of annual bedding plants, including 43 All America Selections breeders' varieties, advanced commercial varieties and newly introduced varieties. Results of these studies resulted in reports to the originators for introduction, improvement and/or cultural methods. Cooperative facets included the provision of plant materials for scientific studies for continuing adult education courses, material for 4-H Club work, and materials for underprivileged child appreciation. Studies for 1967 will continue along the same lines but expanded to include materials for air pollutant studies, new type containers and modified culture for new and/or different bedding plants such as poinsettia.

The Influence of Supplemental Lighting on Carnation Production

Norman W. Butterfield and Glen Hemerick

During the past two years Peterson's Red Sims were continuously lighted at night. With continuous photosynthesis, the dry weight increase in yield over daylight control was approximately 30% from November to May. The photoperiodic effect was a doubling in flower production in early December in time for the Christmas market. The cost was 235 Watts per 35 square feet of bench, 12 hours per night or about 4¢ per night or 50¢ per year for an additional 25 flowers, or 2¢ per flower which wholesale at 10¢ or more each.

INSTITUTE OF AGRICULTURAL AND INDUSTRIAL MICROBIOLOGY

Warren Litsky, Director

The Institute of Agricultural and Industrial Microbiology operates under the capable leadership of Dr. Warren Litsky, and functions as a vehicle for research grants and contracts within the general framework of microbiology.

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

William B. Esselen, Head

Research in the department continued to increase during the year with the availability of new and expanded physical facilities and the continued and active research interests of the faculty. The department's strong graduate program makes a major contribution to its research productivity. Current outside research support from government agencies and industry amounts to approximately $204,000.00 annually, as represented by 11 grants and contracts continued from past years, plus four new ones initiated during the past year. Of particular note is a sizable contract with the Massachusetts Department of Natural Resources, with support from the Bureau of Commercial Fisheries, United States Department of Interior (under Public Law 88-309), in support of a new departmental program in marine food science.

Support to the department's research program was also contributed by four post-doctoral fellows: Dr. Peter Cansfield, Lecturer, School of Agriculture, University of Nottingham, England; Dr. Fergus M. Clydesdale, University of Massachusetts; Dr. Donald M. Kinsman, Associate Professor, University of Connecticut; and, Dr. George M. Sammy, University of the West Indies, Trinidad.

Analytical Chemistry

(Hatch Project No. 191, and
National Institutes of Health)

Irving S. Fagerson and Wassef W. Nawar

The identification of some of the compounds from heated glucose indicates the importance of the role of naturally occurring glucose as a source of flavor components during the roasting process of foods. The first phase of a study of the volatiles arising from heated glucose has been completed. Analysis of a concentrate by gas chromatography showed the presence of approximately 100 compounds. Sixteen of these have been identified by a combination of mass spectrometry and gas chromatography. Of these, six have not been previously reported. Research is continuing on the isolation and identification of volatiles from the cranberry. Methodology has been developed for concentrating the volatiles from the fruit, and preliminary gas chromatographic analysis indicates approximately 250 compounds present in the concentrate.

Lipid Chemistry

(Hatch Project No. 198, and
National Institutes of Health and
United States Atomic Energy Commission)

Wassef W. Nawar and Irving S. Fagerson

A study on thermal oxidation of saturated fatty acids using methyl palmitate as a model has shown that oxidation proceeds via the formation of a series of isomeric monohydroperoxides with the intensity of attack by oxygen greatest near the center of the molecular chain. In a study

on the origin of lactones in heated milk fat, a fraction of milk fat was obtained which contained 2,100 p.p.m. bound delta-decalactone and 8,000 p.p.m. bound delta-dodecalactone. Based on molecular weight considerations, it was concluded that the delta-lactone precursor in milk fat is most likely a mono-acyl-triglyceride. In a study on thermal hydrolysis of fats, work with model triglyceride systems indicated a preferential hydrolysis in favor of the shorter chain and the unsaturated acids. No positional specificity of thermal hydrolysis was noted.

Biochemistry-Enzymology
(Hatch Project No. 197, and
National Institutes of Health)

Herbert O. Hultin

The isolation of the sarcolema of chicken breast muscle for the first time has been accomplished and considerable information as to its enzymic characteristics has been obtained. The glycolytic activity of the muscle mitochondria has been examined and shown to be uniquely related to its structure. An improved procedure was developed for the preparation of banana mitochondria. Studies have shown changes in this fraction with ripening, and these may be related to the climacteric rise. The PME system in bananas has been characterized. Some of its discovered properties may have implications for texture changes during senescence of plant tissue. It was shown that respiration of potatoes stored at low temperature was not limited by the potential activity of the mitochondria and that the accumulation of sugar at low temperatures could be accounted for only in small part by the reduction in respiration with a decrease in temperature.

Food Colorimetry and Chemistry of Plant Pigments
(Hatch Project No. 192,
National Institutes of Health,
Glass Container Manufacturers Institute, Inc.,
and Ocean Spray Cranberries, Inc.)

Charles R. Stumbo and Robert E. Levin

The effectiveness of a non-explosive gaseous mixture of ethylene oxide (12%) and dichlorodifluoromethane (88%) as a vapor phase sterilant at elevated temperatures was demonstrated. Important new parameters for the evaluation of food sterilization processes have been developed, and a significant improvement in the "Improved General Method" for evaluating the sterilizing capacity of heat processes has been made. The application of 4% NaOH at 145°F. to glass containers has been found to be highly effective in destroying *Aspergillus niger* mold spores. The efficiency of the antibiotic nisin as an adjunct to heat in the outgrowth from spores of *Clostridium botulinum*, Types A, B, and E, and the influence of temperature and relative humidity on the death kinetics of bacterial spores exposed to ethylene oxide in the vapor and a gaseous mixture of ethylene oxide (12%) and dichlorodifluoromethane (88%) in the vapor phase was studied.

The influence of sodium chloride concentration and of pH on the thermal resistance of *C. botulinum*, Type E, in fish flesh and the efficiency of

esters of parahydroxybenzoic acid as inhibitors for C. botulinum have been studied.

Studies on the thermal destruction of microorganisms of concern in the aseptic packing of orange juice have been completed. The thermal resistance of lactic acid bacteria, yeasts, and yeast ascospores in buffer at pH 7.0 and in single strength orange juice at pH 4.0 was determined.

Food Acceptance and Effect of Low Temperatures on Quality and Marketability of Food Products
(Hatch Project No. 194,
National Institutes of Health,
and Takeda Chemical Industries Ltd.)

F. Miles Sawyer, Robert E. Levin, and Ernest M. Buck

A chemical method for preserving refrigerated fish allowing a doubling in storage time by dropping in 1% Na_4EDTA was developed. A study was completed on the effect of tension during rigor on the extensibility fiber diameters and sheer forces of bovine skeletal muscle. Research has been carried on in a study on methodology used in determining the flavor effect of 5'-ribonucleotides in processed foods, and on interaction of flavor modifying effects of monosodium glutamate and 5'-ribonucleotides in processed foods. An on-fishing vessel sanitation study based on bacterial enumeration and a retail market survey of the chemical and bacteriological quality of "fresh" fish available in Western Massachusetts were made.

Fluid Dynamics of Circulation Cleaning
(Hatch Project No. 256,
and National Institutes of Health)

Denzel J. Hankinson,
and Charles E. Carver, Jr., (Civil Engineering)

A research project on fluid dynamics of circulation cleaning for the dairy industry is almost completed. It was discovered that a high flow rate during heating and relatively lower temperature differential between heating water and milk are the two most important factors involved in keeping the amount of deposit on heated surfaces at a minimum. High flow rate is a favorable factor in soil removal from heated surfaces and a spiral turbulence generating device.

Marine Food Science
(Massachusetts Department of Natural Resources,
Bureau of Commercial Fisheries,
U. S. Department of Interior (under Public Law 88-309))

Robert E. Levin and F. Miles Sawyer

In early 1967 funding under Public Law 88-309 was received to implement a new departmental program in marine food science. This program is set up to aid the Massachusetts fishing industry through research on sanitation and handling and processing methods aimed at extending the keeping quality of fish and fish products. A differential medium for rapid

detection and identification of putrefactive fish spoilage bacteria has been developed.

Spun Edible Protein Fibers

Kirby M. Hayes and William B. Esselen

A cooperative research project on the spinning of edible protein fiber has recently been established and funded by the Keratene Company, Winsted, Connecticut. Research will include factors influencing properties of spun protein fibers and the incorporation of flavor and other properties into the fiber. A machine for spinning protein fiber, on loan from the Keratene Company, has been installed in the pilot plant.

DEPARTMENT OF FORESTRY AND WILDLIFE MANAGEMENT

Arnold D. Rhodes, Head

With two exceptions, all members of the professorial staff are engaged in research. Our research budget for the past year is approximately $300,000 derived mainly from the State (primarily salaries of professional and supporting staff), the Agricultural Experiment Station, the Massachusetts Water Resources Research Unit, the Massachusetts Divisions of Marine Fisheries, and Fish and Game, the United States Fish and Wildlife Service, and the United States Forest Service. Except for University salaries and $30,000 from Marine Fisheries and Fisheries and Game, the remainder, which is the bulk of our working cash in hand, comes from federal sources.

Highlights of the year were the initiation of two modest research projects supported by the Forest Service, and the consummation of a $78,000 contract with the Office of Water Resources Research (Department of the Interior) for a three-year project, commencing in July 1967, to study the allocation of water resource use in a small watershed.

WOOD UTILIZATION AND TECHNOLOGY

Perpendicular-to-Grain Rheological Behavior of Wood Restrained from Normal Swelling Due to Moisture Increase (McIntire-Stennis Project No. 3)

R. Bruce Hoadley

To determine the quantity and distribution of permanent strain induced by moisture increase in wood restrained from normal swelling. Over-all perpendicular-to-grain compression set has been determined with eleven species. Investigation of strain distribution has been most successful with Moire grid material (1,000 dots/inch). Strain concentrations develop at edges of specimens and in earlywood regions of growth increments. Further analysis will be directed toward investigation of strain in actual product applications, such as furniture joints and tool handles in place.

Technological Properties of Wood from Certain Forest Tree Species in the Northeast. Part I - Physical and Mechanical Properties and Drying Characteristics of Plantation-Grown Red Pine (McIntire-Stennis Project No. 4)

R. Bruce Hoadley and Harold B. Gatslick

To determine the properties and characteristics of plantation-grown red pine, especially as related to the utilization potential of this species, and as compared to forest-grown trees of this species. A survey of general physical and mechanical properties of 16 trees has been completed; the results indicated that the strength properties are generally lower than published species average strength values. However,

the material tested represented trees containing a high percentage of juvenile wood, and observations suggested that outer layers of tree growth had higher strength values. A single typical tree has been chosen for intensive toughness and specific gravity tests; both impact strength and specific gravity increased from pith to bark in this tree, reflecting a decline in growth rate as maturity increases.

Further study will be concentrated along three general approaches: physical and mechanical properties, machining characteristics, and drying characteristics.

Economic and Related Marketing Information on the Forced-Air Drying of Red Spruce (Picea rubens Sarg.) and Eastern Hemlock (Tsuga canadensis (L.) Carr.)
(Northeastern Forest Experiment Station, United States Forest Service)

Harold B. Gatslick

There are some softwood species of trees growing in the Northeast that are fairly abundant and have physical and chemical properties that make them capable of higher value use than they enjoy at present. Recent advances in drying techniques may be used to give these species a new or improved place in the market. Spruce and hemlock drying characteristics and related economics are being studied to develop useful knowledge of different forced-air drying conditions (temperature vs. relative humidity vs. air velocity), utilizing a small cabinet dryer and a large 5,000-foot, pre-fabricated dry kiln.

FORESTRY AND RESOURCE DEVELOPMENT

Experiments in Direct Seeding
(Hatch Project No. 136)

Herschel G. Abbott

Various methods of reforestation by direct seeding have been investigated and one technique has been developed to the stage of operational readiness for use under Northeastern conditions. Seeding of Eastern white pine under hardwoods by both the broadcast and seedspot method has met with repeated success. Results were demonstrated at a Direct Seeding Workshop held at the University in November 1966.

Consumer Analysis of Licensed Hunters and Fishermen in Massachusetts
(Hatch Project No. 264)

Robert S. Bond

Many goods and services provided by forest and outdoor environments are non-marketable. Conventional price-quantity studies are not applicable for determining demand. This research examines the socio-economic characteristics of licensed hunters and fishermen as well as factors intended to measure their degree of participation in these activities. A mail survey was used to collect the data from a sample of license

holders. This is a regional study with five other states participating. All analytical work for the region has been done by Massachusetts at the Computer Center.

Structure of the Northeastern Wood Platform Industry
(Northeastern Forest Experiment Station,
United States Forest Service)

Robert S. Bond

Mechanical materials-handling systems have created increased demands on species in Northeastern forests yielding relatively low-grade lumber. Firms manufacturing pallets and skids comprise the major part of the industry utilizing this material. This study examines the structure of the pallet industry with primary emphasis on characteristics of firms, raw material procurement, and marketing methods. Stratification by mail questionnaire provides a basis of sampling the population for in-depth interviews.

Etiology of Maple Decline (Ecological Relationships)
(McIntire-Stennis Project No. 1)

Donald L. Mader and Joseph C. Mawson

The influence of soil conditions, in particular soil fertility, on the health and vigor and decline of sugar maples is being studied in 20 forest stands. Low nitrogen and calcium levels in the soil appear to be factors which, in combination, are associated with low vigor and evidence of decline. Results of fertilization trials give evidence of strong response in leaf color and nutrient content to nitrogen fertilization, suggesting a possible tool to prevent or arrest decline development.

The occurrence of declining individual sugar maples and their location with respect to topographic and cultural features of the immediate environment is being studied in a survey of shade and roadside trees, maple sugar orchards, and untapped forest stands.

Studies Relating to Forest Hydrology
(McIntire-Stennis Project No. 2)

Donald L. Mader

Investigations of hydrologic characteristics of different types of forest stands and forest soils are being carried on in this project. Stemflow and interception measurements have been made for white pine and mixed oak stands, which allow estimation of stemflow by species, diameter, and rainfall. Soil moisture regimes have been studied in different stand types and soils. Hardwood stands use less water in the spring because of lack of foliage, and re-saturation of soil occurs sooner in the fall, indicating opportunities for greater runoff. Differences in soil moisture extraction patterns at various soil depths were evident between hardwood, white pine, and grass cover types.

Influence of Soil and Site Conditions on the Growth of Forest Stands
(Hatch Project No. 78)

Donald L. Mader and Joseph C. Mawson

Foliar analysis studies of red pine indicate that nutrient uptake patterns within stands are closely related to the growth rates of the individual trees; however, the relationships of observed nutrient levels to growth is not entirely clear because of the variety of patterns of uptake on different soils. Use of foliar analysis as a diagnostic tool appears to require further understanding and refinement but patterns are distinct enoughto be encouraging.

The growth of Eastern white pine and its relation to site characteristics, in particular to the soil, is being similarly investigated on a regional basis in cooperation with the Universities of Maine and New Hampshire.

Recreational Resources of the Connecticut River as Determined by Aerial Photographs
(Hatch Project No. 255)

William P. MacConnell

To develop and test the use of aerial photogrammetric techniques as a tool for identifying and classifying river-based recreation sites. This test will examine a large river system (the Connecticut River), prepare maps of it, catalogue suitable sites for recreational use and make recommendations for their development. It will, also, determine the changes in land use which have taken place along the Massachusetts section of the river since it was last photographed in 1952.

Herbicides in Silviculture

William P. MacConnell

To develop new methods of application of herbicide to individual trees and stands in order to improve the composition and growth of New England forests. Back-pack mist blower application of herbicides to the forest was developed here. An impact tree-punch which cuts holes in trees to hold herbicides and new methods of applying them continue.

Outdoor Winter Recreation in the Forest Environment

William P. MacConnell

To develop and test various techniques for improved development and management of ski areas. The different projects studied fall into these categories: snow control, vegetation control, and development of ski slopes and related facilities.

Christmas Tree Management on Power Line Rights of Way
(Holyoke Water Power Company)

William P. MacConnell

To evolve management and merchandising techniques for Christmas tree growing on power line rights of way. This project has placed the Holyoke Water Power Company's entire power line under multiple-use management consisting of Christmas tree growing and various kinds of agriculture (mostly grazing). Major problems to be solved are brush control, Christmas tree culture, and merchandising the trees.

The Conservation Movement in the Northeast
(Conservation Foundation)

Andrew J. W. Scheffey

A study of the development of conservation commissions in Massachusetts, the movement is now moving into its tenth year and the research is designed to document its development, assess points of strength and weakness, and draw conclusions for future program support and policy guidance, both within Massachusetts and for comparable developments in other parts of the country. A book is in preparation.

Yields of Managed Forest Stands

Arnold D. Rhodes

Test plots have been established in even-aged, pole-sized stands of red pine, Eastern white pine, Norway spruce, Eastern hemlock, and sugar maple, and in uneven-aged Eastern white pine and mixed hemlock and hardwoods. These plots have been placed under intensive management involving pruning as appropriate, thinnings at three and five (mostly) - year intervals, and selection cuttings on a ten-year cutting cycle. Records are kept of mortality, tree and stand development.

Historical Bases for the Land System and Land Utilization of a Western Massachusetts Town (New Salem)
(Faculty Research Grant)

David K. Wetherbee

Each New England town was laid out and settled in a manner peculiar to itself, yet there were certain similarities in land systems as yet unknown to historians. The historical unknowns constitute one of the most frustrating problems to regional planners. By deed abstracting and processing of site data a complete history of the land systems will be realized that will be basic to studies in land utilization, geography, economics, history, planning, forestry and ecology.

WILDLIFE BIOLOGY AND CONTROL OF BIRD POPULATIONS

Ecology of Birds Which Damage Commercial Fruit
(Hatch Project No. 79)

Frederick Greeley and David K. Wetherbee

To gain insight into the movements and general life requirements of birds which feed on commercial fruits. Techniques used include trapping and marking for individual identification of American robins and Baltimore orioles, field observation of marked and unmarked individuals, determination of movements of the young after fledging, of phenology of reproduction, behavior, survival and mortality rates. Also completed this year is a search of the scientific literature concerning visual perception of specific cues by which birds avoid danger.

Food and Shelter Requirements of the Ruffed Grouse in Relation to Energy Regimes
(McIntire-Stennis Project No. 5)

Robert B. Brander

Bioenergetics of the ruffed grouse and its habitats is under investigation. Laboratory studies include calorimetry, basal metabolic determination, and measurement of radiant heat-exchange. Field confirmation of laboratory results is being done primarily by radio-telemetry. These findings are being analyzed with the view of managing forest habitats to enhance grouse productivity.

Ecology and Physiology of Avian Sterility
(United States Fish and Wildlife Service)

David K. Wetherbee and Bernard C. Wentworth

Certain species of native and introduced wild birds are undergoing population explosions incompatible with man's economic, hygienic and aesthetic interests. The need to control this growth of populations is being met by research in the physiological and ecological vulnerabilities of the reproductive process. Embryocides, spermatocides and oocides are being developed and tested in laboratory birds and in wild populations.

The Life History and Behavior of the American Woodcock
(United States Fish and Wildlife Service)

William G. Sheldon

To determine whether there is differential spring arrival from migration of resident yearling and adult male American woodcocks. Other questions to be investigated are the number of surplus males in a breeding population and the possible dominance of adult birds.

Re-establishment of the Wild Turkey in Massachusetts
(Massachusetts Division of Fish and Game)

William G. Sheldon and Frederick Greeley

A study of the productivity, movements and behavior of wild turkeys in Massachusetts. Since flocks now appear to be permanently established in parts of the state, future censuses and studies will be conducted by state personnel.

Pulmonary Edema Syndrome of Game-Farm Pheasants
(Massachusetts Division of Fish and Game)

Bernard C. Wentworth

To determine the effects of various levels of protein and fat in the occurrence of pulmonary edema in the two strains of pheasants being raised on state game farms.

Introduction of Sharp-Tailed Grouse on Nantucket Island
(Massachusetts Division of Fish and Game)

William G. Sheldon and Robert B. Brander

To determine the success of sharp-tailed grouse introduction to Nantucket Island. One hundred grouse from South Dakota were released on the island during the winter.

Differential Toxicity of Lead Shot to Adult and Immature Male and Female Pen-Reared Mallard Ducks
(United States Fish and Wildlife Service)

William G. Sheldon

Lead shot in marshes causes high mortality to waterfowl when the shot is ingested. The Patuxent Wildlife Research Center in Maryland is conducting complex and basic studies on substitutes for lead shot. A graduate student has worked with the Patuxent Center during two summers and will move further research equipment and investigation to the University campus.

FISHERIES BIOLOGY

Ecology of the Fallfish (Semotilus corporalis)

Roger J. Reed

Fallfish specimens have been obtained from various watersheds in Massachusetts and throughout much of their distribution range in Northeastern United States. A comparison will be made of the different age and growth estimates and length-weight relationship. Seasonal feeding habits will be documented; fecundity estimates made; and, early life history recorded.

Status of Native Rainbow, Brook, and Brown Trout in Tributaries of Quabbin Reservoir, Massachusetts

Roger J. Reed

To evaluate the age and growth of naturally reproduced trout in the Quabbin Reservoir and compare these data with studies previously conducted.

Effects of the Cornwall-Stormking Pumped Storage Facilities on the Fishes of the Hudson River
(Consolidated Edison Company)

James A. McCann

To study how the proposed pumped storage power plant at Cornwall, New York, will affect the distribution and survival of the eggs, larvae and juvenile fish species in the Hudson River during the summer months; to determine the effects of the plant on their behavior and to develop ways of eliminating these effects. This study is under the direction of the United States Bureau of Sport Fisheries and Wildlife, the United States Bureau of Commercial Fisheries, and the conservation departments of the States of New York and New Jersey.

The Distribution and Composition of Fish Found in a 32-Mile Segment of the Connecticut River
(Massachusetts Division of Fish and Game)

James A. McCann

To determine distribution and composition of fish in the Connecticut River and their relative abundance; and to relate, where possible, fish life to physical features of the river, an ecological survey of a 32-mile segment of the Connecticut River was conducted to determine the fish distribution and composition. A total of 5,324 specimens, including 31 species, was captured during this survey.

The Relationship of Bottom Organisms to the Food Chain of Fish Species in the Connecticut River Above the Holyoke Dam, Massachusetts
(Massachusetts Division of Fish and Game)

Roger J. Reed

To determine the qualitative and quantitative food habits of Connecticut River fish species according to bottom types, sampling of smallmouth bass, yellow perch, channel catfish, white suckers, and various forage fish was conducted over three distinct bottom areas: rubble, sand, and muck. Chironomid larvae are the dominant member of the bottom fauna in all sampling areas. Laboratory observations on these larvae show that their burrowing habits and encasement in tubes make them almost unavailable to the fish as food. Fish seeking these larvae must of necessity probe the bottom for them, and may ingest much of the sediment. Yellow perch which had eaten midges averaged four to eight percent sand in their stomachs. These preliminary data point to

the dipterous larvae as being one of the most important members of the bottom community as far as fish food is concerned.

The Early Life History of the American Shad (Alosa sapidissima Wilson) Above the Holyoke Dam, Massachusetts
(Massachusetts Division of Marine Fisheries)

Charles F. Cole

To locate the American shad spawning sites in the Connecticut River above the Holyoke Dam, and to document the early life history of the shad in this area, the spawning and rearing areas of the American shad are being evaluated by various sampling techniques on a 37-mile section of the Connecticut River above the Holyoke Dam.

Survey of Small Artificial Recreational Ponds in Central Massachusetts
(Water Resources Research Center)

James A. McCann

To locate, enumerate and classify by habitat type the small artificial ponds in Hampshire County, Massachusetts, ranging in size from one-fourth to five acres. To determine by examination of the ponds the physical, biological, and chemical features, and by interview of the land owner the history and present utilization of the pond. To study the seasonal variation in the chemical, physical, and biological features of the pond and their relationship to utilitarian and recreational uses of the pond.

Limnological Investigations of Selected Farm Ponds in Hampshire County, Massachusetts
(Water Resources Research Center)

James A. McCann

To study the limnological and biological aspects of 12 typical, small artificial ponds in order to establish a realistic management policy for the New England area. Most artificial Massachusetts farm ponds are characteristically shallow (six to eight feet) and small, averaging one-half acre. Temperature stratification usually does not exist in the ponds because of their shallow depths but conditions of anoxia in the deeper waters occurs frequently. An influx of oxygen-free spring water, or respirational and decompositional use of oxygen produces this condition. There is a great seasonal fluctuation in the chemical composition of individual ponds. Plankton blooms are fairly continuous but not extensive enough to cause drastic changes in water quality. Fish populations are usually out of balance and unmanaged. Productivity is on the mildly eutrophic side but sufficient to produce satisfactory fish yields. Only one study pond is incapable of supporting fish life throughout the whole season.

Some Ecological Parameters of Three Ponds in Massachusetts
(Massachusetts Division of Fish and Game,
the United States Fish and Wildlife Service)

James A. McCann and Roger J. Reed

The physical, chemical, and biological parameters of three warm water ponds are being studied to determine their interrelationship and effect upon fish populations, species composition, and individual fish growth rates.

Seasonality of Estuarine Fish
Eggs and Larvae in Massachusetts Waters
(Water Resources Research Center)

Charles F. Cole

To evaluate the role played by a small estuary (the Weweantic) tributary to Buzzards Bay as a production and nursery ground for marine fishes. Plankton and bottom trawl hauls have been made monthly for the past three years and data are now being evaluated.

Pesticide Residues and Their
Effects on Winter Flounder Biology
(Water Resources Research Center)

Charles F. Cole

To study the effect of DDT and other persistent pesticide residues in the Weweantic estuary on the winter flounder. Residue accumulations are being evaluated by gas chromatography; significant accumulations are being found in pre-spawning ovarian tissue. Hypothesis of pesticide transfer through egg yolk to larvae fishes and larvae mortality subsequent to metabolic metabolism is being inbestigated.

The Fecundity and Early Life History
of the Tautog, Tautoga onitis (Linneaus),
in the Weweantic River Estuary
(Massachusetts Division of Marine Fisheries)

Charles F. Cole

A study to estimate the fecundity and the distribution of eggs, larvae and juvenile tautog in the Weweantic estuary. Adult tautog enter inshore waters during early April when water temperatures approach 39.5°F. Spawning commences at the end of May or early June and reaches a peak during the first two weeks of June. Hatching occurs in about 48 to 60 hours. Larvae were found in weedy areas of depths from inshore to about 23 feet. Both adult and juvenile tautog migrate to deeper waters late in November.

Biological Investigation of the Tomcod, Microgadus tomcod (Walbaum) in Weweantic Estuary, Massachusetts
(Massachusetts Division of Marine Fisheries)

Charles F. Cole

Investigation will center on fecundity, age and growth, and the seasonal movements of juvenile and adult tomcod within the Weweantic estuary. A literature search has been completed. Tomcod are being collected and preserved for study.

Age and Growth of the Striped Bass, Roccus saxatilis (Walbaum) in Massachusetts Coastal Waters
(Massachusetts Division of Marine Fisheries)

James A. McCann

The striped bass is the most sought after game fish in New England's marine estuarine complex. Demands by ever-increasing numbers of anglers for sustained yield must be met. Diverse ecological changes brought about by man's population expansion and technological advancements add to the stress on the normal fluctuating populations of striped bass. A better understanding of the life history of the striped bass is essential in order to cope with these interacting parameters. A detailed study of the age and growth of striped bass in Massachusetts will provide this understanding and promote sound management practices. The purpose of this study is to determine recent growth rates of the striped bass in the northern extreme of its range and compare these with a more extensive study of southern populations.

Evaluation of Methods to Collect Sport Fishery Statistics in Massachusetts
(Massachusetts Division of Marine Fisheries)

James A. McCann

In the past, many federal and state agencies have spent considerable time and money to obtain accurate catch effort and landing statistics for the commercial fisheries along the Atlantic coast. Until recently, little effort has been expended in collecting the same data for sport fisheries. This study was started to statistically examine the marine sport fisheries in Massachusetts and to develop, if possible, an efficient and inexpensive method of collecting these data for the coastal fishery. A complete survey was made of the sport fishery in a pilot area of Buzzards Bay during the summers of 1965 and 1966. Information collected included: species of fish taken, areas fished, catch per unit of effort, number and type of boats, persons per boat, methods of fishing, and seasonal trends. Aerial photographs were taken at various altitudes, using several types of film to evaluate the use of these photographs in obtaining instantaneous angler counts.

The Succession of Attached Fauna and Flora on Test Panels in the Cape Cod Canal
(Massachusetts Division of Marine Fisheries)

James A. McCann

An electric generating plant near the east entrance of the Cape Cod Canal in Sandwich, Massachusetts will begin operation in 1968. Water will be taken from the canal, passed through the plant's cooler-condenser system and returned at a higher temperature. Wooden test panels have been placed within the canal at varying distances from the proposed discharge area to determine the normal succession of attached biota prior to the warm water influx. The same tests will be continued after operation of the power plant commences to determine the effect, if any, of the change in water temperature upon the biota.

Sciaenid Comparative Osteology
(National Science Foundation)

Charles F. Cole

To gain insight into the taxonomic and biological relationships of the Sciaenidae, commercially important fishes inhabiting estuaries and near-shore areas in tropical and temperate waters, two cruises off Western South America were completed in July-September 1966 on board R/V Anton Bruun; one by Dr. Charles F. Cole, the other by a graduate student. Sixty gallons of materials for future study were collected. A manuscript entitled "Comparative Osteology of the Sciaenid Genus Sciaenops" has been completed and approved for publication by the "Bulletin of Marine Science" by Topp and Cole.

DEPARTMENT OF LANDSCAPE ARCHITECTURE

Ervin H. Zube, Head

The continuation of very heavy teaching loads places serious limitations upon research activities in the department. Excluding the Department Head, the staff has had an average of 16 classroom contact hours per week per staff member during the past year.

An Annotated Bibliography on Natural Resource and Regional Planning in the Connecticut River Valley

Julius Gy Fabos

A comprehensive search and annotation of significant literature, reports and maps.

Identification and Value of Ornamental Crab Apples

Tom S. Hamilton, Jr.

Investigation of the feasibility of identifying ornamental crab apples by leaves and petiole sections and development of methodology for identification.

Computer Graphics and Its Application to Resource Mapping and Regional Planning

Paul N. Procopio

A study to determine the feasibility of using SYMAP for resource mapping and regional planning thus producing print-outs showing both statistical data and spatial distribution.

GRADUATE STUDENT THESIS RESEARCH

Design Evaluation Utilizing Social Service Research Tools

Rudy Favretti, Advisor Paul N. Procopio

An evaluation of Constitution Plaza, Hartford, Connecticut to determine user response. A comparison of user response to the program goals established by the design consultants Sasaki, Dawson, DeMay Associates, Watertown, Massachusetts.

A History of Frank A. Waugh

James Minges, Advisor Ervin H. Zube

A history and evaluation of the work of Frank A. Waugh, his contribution to the profession of landscape architecture in education and professional practice.

User Preference in Campgrounds
and Its Relation to Physical Design

Bruce Tyson, Advisor Carl A. Carlozzi

A survey of campground users by questionnaire and interview to determine desires and preferences. Development of design criteria reflecting this data.

The Development of the Connecticut River
Waterfront in Springfield, Massachusetts

Howard Nannen, Advisor Ervin H. Zube

An investigation of present land use patterns and influencing factors. Development of alternative proposals for more effective use of the land and shoreline resources.

Case Studies of Selected
Contemporary Urban Parks in Germany

Paul Lederer, Advisor Robert L. Kent

A critical evaluation of postwar urban parks in Germany on the basis of design intent, form expression and social value.

An Evaluation of the Effects of Present and Proposed Flood
Control Measures on Landscape Quality in Hartford, Connecticut

Leonard Campbell, Advisor Ervin H. Zube

An evaluation including economic factors, visual considerations and land use limitations of the existing and proposed flood control measures.

DEPARTMENT OF PLANT AND SOIL SCIENCES

Franklin W. Southwick, Head

The graduate and research programs of the department are being aggressively pursued. During the past fiscal year one new Ph.D. and eight master's degrees were awarded compared to four master's degrees the previous year. The number and size of research grants and contracts received by members of this department were greater than in any previous year. At present, 12 faculty members have major research responsibilities. The areas of emphasis include plant nutrition, physiology and biochemistry, ecology, genetics and plant breeding, soil chemistry and soil stabilization.

PLANT NUTRITION

Procedures for Mineral Analysis of Plant Tissue

John H. Baker

A method has been developed for the extraction and determination of total Ca, Mg, K, Mn, Cu and Zn in plant tissue. The tissue is extracted with 0.1 M ammonium EDTA, filtered, and the filtrate analyzed using atomic absorption techniques. The results obtained by this procedure agree with those obtained after dry ashing the samples. The procedure seems ideal for use in a "quick test" tissue analysis laboratory similar to the soil test laboratories operated by many states.

Relationship Between "Maple Decline" and Chemical Composition of Sugar Maple Leaves

John H. Baker

Chemical analysis of leaf samples from roadside and sugar bush sugar maple trees shows that leaves from sugar maples exhibiting severe leaf scorch symptoms in early summer contain 0.8 per cent Cl or more, while leaves from healthy sugar maples contained smaller Cl concentrations. The Cl increases in the leaves without an equivalent increase in concentration of cations in the leaf, causing a decrease in organic acids in the leaves. Chloride concentrations in leaves from trees growing along roads in Leverett and Sunderland, Massachusetts, were smaller in the summer of 1966 than in the summer of 1965, suggesting that in two years of normal rainfall Cl concentrations in leaves of many roadside trees may be reduced below toxic levels.

The Relationship of Nutrition to Plant Physiological Disorders

Donald N. Maynard

Magnesium nutrition of spinach has been under active study during this period. Mature spinach leaves exhibit severe Mg chlorosis when the Mg content is less than 0.17 per cent. Leaf lamina tissue is a more

sensitive indicator of the Mg status of the plant than petiole or leaf and petiole samples. Significant quantities of Mg are leached from spinach foliage by prolonged overhead irrigation. This may accentuate chlorosis problems in cases where incipient Mg chlorosis prevails.

The variation of magnesium content among corn inbreds has been studied. Results of experiments have suggested that the mechanisms of genetic control of Mg accumulation is a complex situation controlled by several genes.

The relationship between rubidium accumulation and protein synthesis in Euglena gracillis was studied. It was determined that chloramphenicol, an inhibitor of protein synthesis, affected both glycine incorporation and RB uptake. This suggests an intimate relationship between ion absorption and protein synthesis.

Plant and Nutrition Variables Associated With Ammonium Assimilation in Plants

Donald N. Maynard and Allen V. Barker

Stem lesions of tomato plants are a manifestation of ammonium toxicity and occur when the ammonium potassium ratio in the plant material is high. Additions of potassium increase this ratio and prevent the occurrence of stem lesions. The relationships between potassium and ammonium assimilation are being actively investigated.

The effects of ammonium on the photosynthetic mechanisms of tomato leaves was studied. Ammonium nutrition resulted in chlorophyll loss, reduced photosynthetic rates, and destruction of chloroplasts. Anatomical studies of the stem lesions showed that the cortex and epidermis were the only areas affected. Damaged cells showed collapse, thickened walls, or accumulation of an unidentified crystalline substance. This project is being supported in part by a grant from the Massachusetts Society for Promoting Agriculture.

Cation Exchange Capacity of Plant Roots

Mack Drake and John H. Baker

A new method for measurement of cation exchange capacity of plant roots has been developed. Non-metabolic adsorption of Li, primarily by cation exchange, is measured by allowing the roots to accumulate Li for 30 minutes from an Oil N, Li, Cl solution, while metabolic uptake of Li is inhibited by bubbling N_2 gas through the solution. This method is rapid and only cation exchange capacity that is functional under conditions of cation uptake experiments is measured.

Relationship of Application of Mineral Elements to Cation Uptake and Physiological Disorders of Apples

Walter D. Weeks, Mack Drake and Louis F. Michelson

Hydrated dolomitic limestone injected as a slurry into the root zone under apple trees significantly increased the uptake of both Ca and Mg

within twelve weeks after treatment. This is an important finding, since soil surface applications or soil cores of Ca and Mg require several years before increased uptake of these elements takes place.

Bitter pit of Baldwin apples is more closely associated with the Ca level of the fruit peel than its level in apple leaves. This disorder is also associated with the K/Ca ratio in the peel. Low incidence of bitter pit is associated with high peel Ca and low K/Ca ratio.

Preliminary investigations indicate that surface russeting of Golden Delicious apples is related, at least in part, to high levels of nitrogen in the foliage.

PLANT PHYSIOLOGY AND BIOCHEMISTRY

Fruit Carbohydrases

Hebert V. Marsh, Jr.

The growth retardant N-dimethylamino succinamic acid retarded starch utilization in apples. A classical alpha-amylase was partially purified and characterized. Evidence also was obtained for a heat-labile, acid-stable enzyme capable of hydrolyzing amylopectin.

Response of Growth Substances on Lignification and Phenol Metabolism in Plants

Herbert V. Marsh, Jr.

Certain chemicals such as Amo-1618, Phosphon-D and CCC retard stem elongation by inhibiting gibberellin biosynthesis. Gibberellic acid (GA) promoted growth by inducing an enhanced formation of DNA. It is not clear, however, why the normal DNA complement is insufficient to support the maximum possible stem elongation, nor which metabolic processes are limiting in the absence of GA.

Lignification is thought to occur after growth ceases, so the effect of GA on lignin formation was investigated with the expectation that GA might retard this process. Instead, GA promoted lignification in a dwarf pea, both on a per plant and dry weight basis. This GA enhanced lignification was probably not a direct cause of stem elongation, however, as evinced by the observations that the enhanced lignification did not detectably precede the GA promoted growth. Also, although GA promoted growth of a tall pea variety it had little effect on the percentage of lignin in this variety. Further, neither Amo-1618 nor Phosphon-D appreciably affected lignification.

The fact that GA did promote lignification in the dwarf plant suggested that GA somehow affected phenol metabolism. Two enzymes involved in this process are under study. A key enzyme in phenol biosynthesis, phenylalanine ammonia lyase, was purified 30-fold from maize. The molecular weight and Stokes radius were estimated and some kinetic parameters determined. The enzyme appears to be an allosteric protein subject to conformational changes induced by the reaction product, cinnamic acid. This property may provide one method for regulating

phenol and lignin formation. It was found that GA increased the total and specific activities of this enzyme in dwarf peas. The other enzyme under study oxidizes tyramine to 3-hydroxytyramine and serves as a model for the hydroxylation type of reaction which is poorly understood but basic to phenol biosynthesis. The enzyme was purified 15-fold from banana pulp and shown by fluorometric analysis to definitely form a 3-hydroxytyramine. A most exciting finding was the observation that this enzyme was subject to an apparent instantaneous inhibition which was completely overcome by dilution.

Post-Harvest Physiology of Apples

William J. Bramlage, William J. Lord
and Franklin W. Southwick

Spectrophotometric analysis of intact Delicious apples showed that although watercore rapidly disappeared from the apples during storage, the more intense the watercore concentration at harvest the more susceptible the fruit was to internal breakdown.

Watercore significantly suppressed O_2 uptake by apple tissue, but did not affect CO_2 evolution. However, mitochondria extracted from severe-watercored tissues had the same oxidative capacity as those extracted from watercore-free tissue. After watercore disappeared from the tissue, O_2 consumption, as well as CO_2 production, was the same as for tissue never having had the disorder.

Pre-harvest treatments of 2,000 and 5,000 ppm Alar applied to Cortland, Rome, McIntosh, and Delicious apples retarded fruit softening on the tree and during storage. The treatment also reduced watercore development in Delicious and storage scald development in Cortland.

It was shown that the length of time before controlled-atmosphere storage produced fruits superior in quality to those in regular storage is quite variable and cannot be defined.

Fructose Levels in Forage and Turfgrass Species

Mack Drake, William G. Colby and Louis F. Michelson

Results show that reserve carbohydrate levels (as indicated by fructose content) decline following the application of nitrogen. Also, if the prevailing weather (immediately following mowing) is hot and dry the level of this carbohydrate may fall to a critical point which often results in limited recovery of these grass species and plant injury.

Physiology of Low-Temperature Injury on Ornamental Plants

John R. Havis

Work in preceding years had indicated that desiccation is an important cause of winter injury of *Ilex opaca*. The effect of typical winter environmental factors on stomatal activity and rates of drying in this

species were studied. Maximum stomatal opening occurred at relatively low light intensities of 1,000 to 2,000 ft-c and at leaf temperatures near 48°F. Opening was reduced at lower temperatures, but significant opening occurred at 30°F. Leaf water stress caused only slight reduction in opening, and the rate of drying did not appear to be affected. The rate of drying of leaves was generally well related to vapor pressure gradients and significant dehydration developed at leaf temperatures as low as 29 to 30°F.

PLANT GENETICS AND BREEDING

Genetics and Breeding of Tomatoes

William H. Lachman and Ian de la Roche

The inheritance of the "yellow-green" series of chlorophyll deficient mutants (yg-1 to yg-6) was found to be genetically controlled and non-allelic. Appropriate data gave evidence that (yg-6) is located at locus 50 on chromosome 11. In another experiment, in mapping the "neglecta" mutant, the data indicated that neg is located at locus 29 on chromosome 11.

A superior F_1 tomato hybrid, tentatively named "Redman," has been developed and tested locally. This has been submitted for trial to the All-America Selections Committee in 1967.

A compound homozygous genetic tester has been developed; i.e., a-1 hl j_1 neg_1, with all mutants located on chromosome 11. This will allow for testcross analysis and a more precise positioning of neg on the chromosome.

Heat Treating Seed of T-Cytosterile C13 Sweet Corn

William H. Lachman

The search for cold resistant sweet corn with very early maturing, high, row-count ears resulted in the development of hybrid "Early Golden Giant" which will be introduced to the trade in 1968. A new hybrid, tentatively named "Golden Lustre," has been entered in the All-America Trials for 1967.

In 1956, dry seed of Texas sterile inbred C13T15 was subjected to high temperatures (72-80°C.) for 1-4 days. "Japonica Striping" was abundant in plants from the treatment, indicating some cytoplasmic effects but pollen shedding was not induced. In 1966, seed of T-sterile lines of C13, C30 and Ma 21565 were held at 75 and 78°C. for 10 days. Seed germination and plant vigor were affected adversely, particularly at 78°C. but fertility was not changed. Only a few treated plants showed the Japonica striped pattern but this was not evident in the controls.

A composite has been developed from several lines homozygous for pollen restoration in Texas-sterile cytoplasm, and should provide a very important source of germplasm for developing early and midseason inbreds to be used as pollinators for cyto-sterile lines.

WEED ECOLOGY

Ecology of Echinochloa Crusgalli (L.) Beauv. and Portulaca Oleracea

Jonas Vengris

Electron microscope procedures were used in cytological studies of barnyardgrass (Echinochloa crusgalli (L.) Beauv.) chloroplasts following root absorption of atrazine. Electromicrographs of these chloroplasts indicate severe disruption of their fine structure after periods as short as two hours. The stage of growth at which plants were treated was of no significance in determining changes at the ultrastructural level.

Studies of the relationship of seed maturity to germination ability indicate that the more mature seeds are most viable. However, barnyardgrass seeds at an early stage of ripening (milk-dought) have a high percentage of viability.

Fourteen year-old purslane seeds, as well as those freshly collected, were found to be viable. Undeveloped seeds on uprooted purslane plants frequently develop into mature viable seeds. Rooting of purslane stems as a means of propagation of this weed is of limited importance.

SOIL STABILIZATION

Roadside Slope and Sand Dune Stabilization

John M. Zak

Sweetfern rhizome plantings have been found to be quite useful as a means of stabilizing roadside cuts and fills and reducing maintenance costs. Direct seeding of trees and shrubs under a wood-chip mulch on highway slopes shows considerable promise as well.

Sand dune stabilization involves the use of a variety of native plant species. Beachgrass plantings serve as an excellent means of reducing sand movement but suitable methods of rapidly seeding, obtaining germination and obtaining substantial vegetative growth of well-adapted perennial grass species are needed and being investigated. Suitable types of woody climax vegetation are being sought to follow the initial grass cover. Supported by funds available from the Massachusetts Department of Public Works and the Bureau of Public Roads.

SOIL CHEMISTRY

Neutralization Reactions in Acid Soils and Their Effect on Plant Growth

John H. Baker

Preliminary results show that the rate of penetration of roots of barley seedlings into eight acid soils was found to be related to the manganese concentration in the displaced soil solution but was not

related to the concentration of Al, Ca, Mg or K in the displaced soil solution. Although the growth of the barley roots was reduced 50 per cent in some soils, as compared to growth in the control soil, the growth of the primary root of sweet corn was the same in all the soils tested.

Adsorption of Pesticides on Earth Materials
(Water Resources Research Center Project WR-8)

John H. Baker

A study is being made of factors influencing adsorption of the herbicide atrazine (2-Chloro-4-ethylamino-6-isopropylamino-s-triazine) and the insecticide diazinon (O, O-Diethyl-2-isopropyl-4-methyl-6-pyrimidinyl phosphorthioate) on soils from Massachusetts. Adsorption of both of these compounds on the soils was found to increase as soil organic matter content increases. Other soil properties, such as soil pH, clay content and salt concentration do not seem to influence greatly the adsorption of these compounds on the soils studied. Soil properties, such as pH and clay content, may influence the stability of diazinon in soils. Diazinon was found to be degraded by chemical hydrolysis much more rapidly in the presence of an acid (Al saturated) clay suspension than in water at the same pH. Hydrolysis of the compound was slower, however, in a neutral (Ca saturated) clay suspension than in water.

DEPARTMENT OF VETERINARY AND ANIMAL SCIENCES

Thomas W. Fox, Head

Research activity coordinated with the graduate programs of the department has continued to be one of the major areas of departmental emphasis and effort. The year 1966-67 has been a highly productive one, with 40 publications published in scientific journals.

The research program has benefited from the ambitious and creative studies of our graduate students and post-doctoral scholars. Dr. Gustavus Currie, a post-doctoral, with Dr. Donald L. Black was partially supported by a University biomedical grant. In addition, a formal recognition of the work in physiology of reproduction was made by designating Dr. Donald L. Black, Principal Scientist, Laboratory for Reproductive Physiology.

Research grants from the National Institutes of Health, Agricultural Research Service, Cooperative State Research Service, the Population Council, and from industrial sources totaled $264,678.00. These grants supporting the basic research of the department provide a valuable adjunct to our research endeavors.

ANIMAL DISEASES

Infectious Diseases Affecting Reproduction in Cattle With Emphasis on Leptospirosis and Viral Diseases

(Hatch Project No. 158, and National Institutes of Health)

Russell E. Smith and Iona M. Reynolds

Studies on experimentally produced leptospiral infection in ruminants and the subsequent effect on abortion. A fluorescent antibody technique for the identification of leptospiral infection has been developed for use in experimental studies and in diagnosis.

Salmonellosis of Poultry

(Hatch Project No. 278, and National Institutes of Health)

Glenn H. Snoeyenbos

Methods of detecting Salmonella in poultry and poultry products. Determination of the time and temperature necessary to kill Salmonella in feeds. Studies of the virulence and dynamics of infection of Salmonella in chicken flocks.

Avian Lymphomatosis
(Hatch Project No. 203)

Martin Sevoian and Knut M. Anderson

Determination of the pathogenesis and epizootiology of neurolymphomatosis, including the study of the etiologic agent through growth in chicken embryos, young chicks and in tissue culture. The isolation of the JM virus responsible for an acute form of lymphomatosis in chickens represents a significant contribution of this project. Characterization of the virus and the feasibility of developing a vaccine is being continued.

Respiratory Diseases of Poultry
(Hatch Project No. 111, and
the Massachusetts Society for Promoting Agriculture)

Olga M. Olesiuk and David Roberts

Studies on the modes of transmission of *Mycoplasma gallisepticum* with emphasis on egg transmission and direct or indirect contact under different environments. Investigations on the response of *Mycoplasma gallisepticum* to medication and the feasibility of eradication of the disease from poultry breeding flocks. Egg transmission has been shown to occur, the latency or carrier state of the organisms following infection has been determined, and eradication has been shown to be a feasible method of control of the disease.

ANIMAL GENETICS

The Genetic and Environmental Aspects of Total Solids, Solids-Not-Fat and Its Components in Milk
(Hatch Project No. 177)

Stanley N. Gaunt and Frank N. Dickinson

Studies to determine the repeatability and heritability of milk constituents and the genetic and phenotypic correlations between milk constituents and milk yield in dairy cattle. A detailed study of the environmental factors affecting milk composition and the laboratory methods for the determination of milk composition. Reliable estimates of heritability for these traits have been established and laboratory methods for the determination of milk composition have been developed.

The Performance of Populations of the Domestic Fowl as Influenced by Heritable Physiological Traits and by Genes With Known Pleiotropic Effects
(Hatch Project No. 233)

J. Robert Smyth, Jr. and Thomas W. Fox

A study of the pleiotropic effects of certain genes influencing melanization and mophological traits in the domestic fowl. The gene for rose comb has been shown to drastically reduce the viability of gametes produced by homozygotes. Recessive white reduces growth rate and a series

of alleles concerned with melanization affect viability. These studies are being extended using the JM virus to determine if the differential mortality observed is associated with genetic resistance to leucosis.

ANIMAL PHYSIOLOGY

Pituitary and Ovarian Function in Relation to Fertility
(National Institutes of Health, and the Population Council)

Donald L. Black, Joseph W. McDaniel, and Gustavus Currie

An investigation of the role of the pituitary gland and hypothalamus in ovulation and corpus luteum formation and function. Histological and histochemical studies of the corpus luteum have been completed through the entire bovine estrus cycle. In addition, the physiology of the uterus and oviduct in the fertilization process and embryo survival is actively being investigated.

Thyroid Physiology in Chickens and Turkeys
(Hatch Project No. 159)

William J. Mellen and Albert J. Farrington

A study of the value of plasma PBI^{131} level as a criterion of thyroid state in chickens and turkeys. An endocrine physiology survey of two lines selected for early rapid and slow rate of growth has been completed during the year. The role of the pituitary gland in determining the differential growth rate between the two lines is currently under study.

ANIMAL NUTRITION

Endocrine Physiology Associated With Nutritional-Environmental Interactions in Chickens, Turkeys and Japanese Quail
(Hatch Project No. 250)

Donald L. Anderson

A study of the value of Se-75 uptake by parathyroid tissue as an assay of calcium metabolism in avian species. This research includes the effects of modified environments on calcium metabolism and on parathyroid and adrenal function.

Ruminant Digestion

Sidney J. Lyford, Jr. and Heinrich Fenner

A study of pectin digestibility, the sites of pectin digestion and pectinase enzymes.

COLLEGE OF AGRICULTURE

1966-67

SECTION IV -- PUBLIC SERVICE

HIGHLIGHTS

STATUTORY CONTROL PROGRAMS

DIAGNOSTIC LABORATORIES

HIGHLIGHTS

Feed, Fertilizer Laws, Seed Laboratory

Gersten, Bertram, and Vlach, E. F.

Cooperation with Department of Plant and Soil Sciences:

1. Leaf tissue analyses.
2. Types of lime materials best suited to control atmosphere of stored apples.

Kuzmeski, John W.

Cooperation with Department of Plant Pathology and Entomology on research project involving pesticide residues in or on agricultural crops.

Rice, William N.

1. Has lectured to students in Turf Management and Agrostology.
2. Served as member of advisory committee for two Master's theses programs (both in Forestry).

Smith, C. Tyson

1. On Thesis Committee (Master's), Richard Callahan, Department of Plant Pathology and Entomology. Work under Professor Smith's supervision involved research in gas chromatography of pesticide residues in eggs and chicken tissues.
2. Consultant for Thesis Committee (Master's) of Roderick Smith, Department of Forestry and Wildlife Management. Subject: "Pesticide Residue Effects on Larval Marine Fish" (by gas chromatography).
3. Cooperated with Department of Plant Pathology and Entomology in determination of pesticide residues and in some research on methodology for the gas chromatographic determination of pesticide residues.

Veterinary and Animal Sciences

The control programs of the department continue to be a significant public service function. The productivity of the Mastitis Laboratory has doubled from the 48,000 sample level of 1964-65. However, we still have a backlog of dairymen interested in enrolling in the program. The State Department of Agriculture has requested that a new program of testing for *Mycoplasma gallisepticum* be initiated on July 1, 1967. This testing service will place additional stress on our laboratory resources and will require additional funds.

STATUTORY CONTROL PROGRAMS

Responsibility for enforcing various state statutes regulating the composition and use of feeds, fertilizers, seeds, milk dairy testing glassware, licensing of milk truck drivers, and the diagnosing of certain diseases of poultry, cattle and elm trees has been assigned to the Trustees of the University of Massachusetts by the General Court.

The Experiment Station administers these statutory regulations designed to (1) protect the health of humans and animals, (2) the consumer from buying products not conforming to the manufacturer's guarantee or potentially harmful to animals, and (3) to reduce to a minimum any potential hazard to man and animals because of the use of pesticides on crops and drugs in feed.

PULLORUM CONTROL
MASTITIS CONTROL
SHADE TREE LABORATORIES
FERTILIZER INSPECTION
FEEDSTUFFS INSPECTION
SEED INSPECTION
DAIRY LAWS

PULLORUM CONTROL

Department of Veterinary and Animal Sciences

In the 1965-1966 testing season, 275 chicken, turkey and pheasant flocks were tested, representing 514,944 samples. No pullorum nor fowl typhoid infection was found among the commercial breeding flocks tested. Pullorum infection was detected in nine fancier flocks and one large commercial egg flock which was tested. In addition, the diagnostic service found pullorum infection in one small commercial egg flock, and fowl typhoid infection in another small egg flock. The infection has been eliminated in these flocks by either retesting or by depopulation.

Paratyphoid infection was detected in five chicken flocks tested for pullorum disease. Salmonella typhimurium was isolated from two of the flocks, and there was one isolation each of S. enteritidis, S. heidelberg and S. typhimurium var. copenhagen.

MASTITIS CONTROL

Department of Veterinary and Animal Sciences

During the calendar year of 1966, 106,641 milk samples were tested for mastitis. Of this number, 102,090 were from 220 private herds, 4,190 from five state herds, 180 from two county herds, and 181 were tested on an experimental basis. Fifty-six of 79 herds on initial test were found positive for Str. agalactiae with 28% of the cows infected. Thirty-four herds were freed.

A total of 123 annual or semiannual tests was made on 99 herds that had been Str. agalactiae-free. Eleven herds were found to have become infected, nine of them by the addition of purchased

replacements. In one herd a home-raised heifer reintroduced this infection upon freshening, and in one instance the source was not determined.

Nocardia mastitis was found in two more herds in the state, which brings the total of such infected premises to 29 since 1953.

An outbreak of Mycoplasma (PPLO) mastitis occurred in a large-scale dairy operation that involves the frequent introduction of cattle purchased from out-of-state sources.

Favorable results were obtained in the trial treatment of mastitis infections in dry cows, using two intramammary infusions a week apart containing 100,000 u of penicillin and 500 mg of furaltadone. Apparent cures resulted in 83% of 114 infections treated. Staphylococcic infections were found to be more refractory than those due to streptococci.

SHADE TREE LABORATORIES

The chief basis for "field and laboratory work in connection with the Dutch elm disease and other shade tree diseases and insects" under state law is the protection of the public interest in the broadest sense.

For the report year 1966-67, the Laboratories made between 10,000 and 15,000 elm biopsies and handled 1,000 inquiries on many of more than 100 other kinds of trees. Related field studies in cooperation with municipal tree departments were conducted simultaneously.

An especially important diagnosis centers around investigation of any treatment represented to cure the Dutch elm disease. Control service checks on materials and techniques advocated in the Commonwealth

currently being evaluated are: 1. a soil-injected chemical proposed for control of Dutch elm disease, 2. a fertilizer said not to injure trees if mixed with the soil put around their roots at time of transplanting, 3. the assumption that planting too deep injures maple trees, and 4. the assumption that girdling by their own roots injures maple trees.

The control activities of the Laboratories are chiefly a direct service to the 351 Municipalities of the Commonwealth and State Departments as well as to homeowners, including the saving to taxpayers of thousands of dollars in preventing fraudulent, worthless or destructive treatment of wealth in trees common to the state. Related expenditures by municipalities alone for tree programs exceed $5,000,000 annually. The original legislation to establish the program at the University was sponsored by municipal officials and conservation commodity groups.

Within the framework of the University, the research on tree pest programs and the teaching program in arboriculture are outgrowths of the original shade tree control program and all are still closely correlated.

FERTILIZER INSPECTION

Fertilizer Control Service Staff

In carrying out the General Laws providing for the inspection and sale of commercial fertilizers and lime products, 650 samples were processed during the year 1965-66. The laboratory also processed 1,000 samples of both fertilizer and feed for state institutions.

The law provides, in part, that 1. all fertilizers shall be

labeled showing (a) net weight, (b) name, brand or trade-mark and grade, (c) name and address of manufactuer, and (d) the guaranteed plant food content; and 2. all fertilizers and lime products shall be subject to sampling and analysis.

FEEDSTUFFS INSPECTION

Feed Control Service Staff

A total of 1,195 official samples of commercial feedstuffs, including 972 nonmedicated and 223 medicated feeds, were inspected during the latest report year 1965-66. Of these 1,195 samples, 66 or 5.5% were found to be deficient. In addition, the feed laboratory processed 1,000 samples of both feed and fertilizer for state institutions.

Pesticide residue determinations were made on most of the ingredients and on some mixed feeds. While many of the feeds tested contained pesticide residues, the amounts found in most instances were considered insignificant. Many samples tested contained no detectable residues.

A highlight of the feed inspection program in general is the commissioning of state feed control officials as officers of the FDA by the Federal Food and Drug Administration. Because of the large number of drugs used in feeds for a multiplicity of purposes, this new era of closer cooperation between federal and state agencies is beginning. This is necessary to insure as much as possible that no drug residues harmful to human health shall appear in human foods.

SEED INSPECTION

Seed Control Service Staff

Tests and analyses were made on 2,257 samples of seeds from commercial suppliers and others to determine seed quality during 1965-66.

Additionally, 2,400 germination tests were made (including 334 components of mixtures from samples submitted).

A total of 218 purity tests, 18 field tests, and 85 other tests (identification and research) also were made.

In February of 1967 a one-day, 4-hour short course was conducted for Massachusetts Department of Agriculture seed inspectors. The purpose of the course was to provide an opportunity for participants to gain an insight into their work with a personal objective of becoming more efficient seed inspectors.

Course content included: 1. Study of Massachusetts Seed Act (labeling prohibitions, enforcement), 2. The Seed Inspector's Role (sampling, examination for requirements, check list, stop-sale action), and 3. The Seed Laboratory's Role.

DAIRY LAWS

Dairy Laws Control Service Staff

Duties of the staff under provisions of the laws are:

1. Calibrate for accuracy all apparatus such as pipettes and milk test bottles used by inspectors either in Public Health Laboratories or in laboratories testing milk and cream when tests are used as a basis for selling milk or cream. About 5,000 pieces of glassware were tested during the year.
2. Inspect once a year all centrifuges used in above laboratories in making tests.
3, Issue certificates of competency in testing milk and cream to those who pass examination given by the Experiment Station inspector or who pass the short course given by Stockbridge School.

4. Issue licenses for measuring, sampling and accepting raw bulk milk from a producer at a dairy farm to those who pass an examination given either by the Experiment Station inspector or by a member of the Food Science and Technology Department.

DIAGNOSTIC LABORATORIES

The College of Agriculture provides veterinary diagnostic services for poultry and large animals. These services are built-in, nonstatutory services as differentiated from the Control Programs required by state law. The Diagnostic Laboratories work primarily with individuals on a problem-solving basis as the need arises. Most of the poultry diagnostic work is performed by the Department of Environmental Sciences at Waltham. Both poultry and large animal diagnostic services are conducted by the Department of Veterinary and Animal Sciences at the University in Amherst. This combined report presents individually the activities of both departments.

SUMMARY
POULTRY
LARGE ANIMAL

Department of Veterinary and Animal Sciences, Amherst;
and Department of Environmental Sciences, Waltham

SUMMARY

During the calendar year January 1, 1966 through December 31, 1966 a total of 8,685 avian and mammalian specimens in 1,127 consignments was submitted for laboratory examination. Specimens submitted were as follows:

AVIAN	Amherst	Waltham
Chicken	2,790	4,170
Turkey	50	266
Pheasant		26
Duck	8	89
Miscellaneous	23	353
MAMMALIAN		
Cattle	532	
Sheep	30	
Swine	70	
Horses	69	
Miscellaneous (18 species)	93	52

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DEPARTMENT OF ENVIRONMENTAL SCIENCES
Waltham, Massachusetts

REPORT OF DIAGNOSTIC LABORATORY

AVIAN

Chicken Diagnoses (4,170 Specimens)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Acariasis	3			3
Ascariasis	5			5
Aspergillosis	2	1		1
Avian encephalomyelitis (Epidemic tremor)	6	5		1
Avian vibrionic hepatitis	1			1
Blepharoconjunctivitis	1			1
Cannibalism	3			3
Capillariasis (C. obsignata)	25		1	24
Carbon monoxide poisoning	2	1		1
Chronic respiratory disease	58		27	31
Coccidiosis	65	3	30	32
Colibacillosis	46	11	18	17
Dermatitis	4			4
Enteritis	9			9
Enterohepatitis	1		1	
Fatty liver	1			1
Faulty husbandry	1	1		
Formaldehyde toxicity	1	1		
Fowl cholera	1			1
Gout, visceral	7	1		6
Gumboro disease (Nephrosis syndrome)	11	3	8	
Heat prostration	1			1
Hemangioma	3			3
Inanition	3	3		
Infectious bronchitis	4	3	1	
Infectious laryngotracheitis	2			2
Infectious synovitis	9		4	5
Lymphomatosis, neural	11		7	4
Lymphomatosis, visceral	130		48	82
Molt, physiologic	7			7
Nephrosis	2	1		1
No diagnosis	22	9	3	10
Normal	4		4	

Chicken Diagnoses (continued)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Osteomalacia	1			1
Osteopetrosis	3		1	2
Paratyphoid (7 serotypes)	10	3	4	3
Pediculosis	7		1	6
Peritonitis, post-operative	1		1	
Perosis	2		2	
Plantar necrosis	1			1
Prolapsus	1			1
Proteus infection	1	1		
Pullorum disease	1			1
Respiratory infection	9		6	3
Ruptured gastrocnemius tendon	1			1
Salt poisoning	2	1	1	
Streptococcosis	3	1	2	
Suffocation	1			1
Sulfaquinoxaline toxicity	3		3	
Taeniasis	1			1
Toxemia	3	1	1	1
Traumatism	3			3
Ulcerative enteritis (Quail disease)	1			1
Vitamin D deficiency	2	1		1
Water deprivation	2	1		1

Turkey Diagnoses (266 Specimens)

Aneurism, dissecting	3		1	2
Arthritis, staphylococcal	1		1	
Ascariasis	2		2	
Asphyxiation	1	1		
Cannibalism	1	1		
Coccidiosis	1	1		
Colibacillosis	8	3	4	1
Enteritis	1	1		
Enterohepatitis	1		1	
Erysipelas	3		1	2
Fowl cholera	4		1	3
Fowl pox vaccination	1		1	
Gout, visceral	1			1
Hepatitis, viral	4	2	1	1
Hepato-granulomatosis	1		1	
Histostat toxicity	1		1	
Hock disease	2		2	

Turkey Diagnoses (continued)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Inanition	1	1		
Infectious sinusitis	6	1	4	1
No diagnosis	2		1	1
Normal	1			1
Paratyphoid (3 serotypes)	3	1	1	1
Peritonitis	1			1
Round-heart disease	1		1	
Staphylococcosis	1		1	
Transmissible enteritis	6	3	1	2
Traumatism	1			1
Vitamin D deficiency	2	1	1	
Grackle Diagnoses (161 Specimens)				
Aspergillosis	4		1	3
No diagnosis	2			2
Syngamus trachea infection	3	1	2	
Toxemia	1			1
Duck Diagnoses (89 Specimens)				
Avian tuberculosis	1			1
Frostbite	1			1
Malnutrition	1		1	
Paratyphoid	3	3		
Peritonitis	1		1	
Traumatism	1			1
Cowbird Diagnoses (57 Specimens)				
No diagnosis	1			1
Paratyphoid	6		4	2
Traumatism, internal	1		1	
Starling Diagnoses (38 Specimens)				
Aspergillosis	1			1
Enteritis	1			
Erysipelas	2		1	1
No diagnosis	1		1	
Taeniasis	1			1
Toxemia	1			1

Pigeon Diagnoses (29 Specimens)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Abscess	2		1	1
Ascariasis	2			2
Aspergillosis	1			1
Hemorrhage, pulmonary	1			1
Normal	1			1
Ornithostrongylus quadriradiatus	1			1
Paratyphoid	1	1		
Pediculosis	2		1	1
Pigeon pox	1		1	
Pneumonia	1			1
Respiratory infection	2		1	1
Staphylococcosis	1			1
Toxemia	4			4
Traumatism	1			1
Trichomoniasis	1			1
Pheasant Diagnoses (26 Specimens)				
No diagnosis	2		2	
Pulmonary edema	1			1
Traumatism, head	1			1
Robin Diagnoses (19 Specimens)				
Capillariasis	3			3
Colibacillosis	1			1
DDT toxicity, tentative	4			4
No diagnosis	2	1	1	
Pasteurellosis	1			1
Syngamus trachea infection	3		2	1
Taeniasis	4			4
Herring gull Diagnoses (10 Specimens)				
Malnutrition	1			1
No diagnosis	1			1
Taeniasis	1			1
Traumatism, head	1			1
Traumatism, internal	2			2
Parakeet Diagnoses (8 Specimens)				
Acariasis	1			1
Enteritis	2		1	1
Enteritis, hemorrhagic	1			1
Gout, articular	1			1
Neoplasm, unidentified	1			1
No diagnosis	1			1
Peritonitis	1			1

Mourning dove Diagnoses (6 Specimens)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Aspergillosis	1			1
No diagnosis	1		1	
Toxemia	2			2
Trichomoniasis	1			1
Quail Diagnoses (17 Specimens)				
Quail bronchitis	1		1	
Quail disease (Ulcerative enteritis)	1		1	
Canary Diagnoses (4 Specimens)				
DDT toxicity, tentative	1			1
No diagnosis	1			1
Pneumonia	1			1
Chukar partridge Diagnoses (2 Specimens)				
Enterohepatitis	1		1	
Paratyphoid	1		1	
House sparrow Diagnoses (2 Specimens)				
Coccidiosis	1			1
Paratyphoid	1			1
MAMMALIAN				
Rabbit Diagnoses (44 Specimens)				
Cirrhosis	1			1
Coccidiosis	5		5	
Enteritis	1		1	
Impaction, stomach	1			1
Mastitis	1			1
Mucoid enteritis	1			1
Guinea pig Diagnosis (8 Specimens)				
Streptococcosis	1		1	

DEPARTMENT OF VETERINARY AND ANIMAL SCIENCES
Amherst, Massachusetts

DIAGNOSTIC LABORATORIES

Report of the Poultry Diagnostic Laboratory

Chicken Diagnoses (2,790 Specimens)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Adenocarcinoma	1			1
Ascariasis	1		1	
Aspergillosis	1			1
Avian encephalomyelitis	2	2		
Bronchitis, infectious	1		1	
Bumblefoot	1			1
Cannibalism	2			2
Capillariasis	6			6
Chronic respiratory disease	12		12	
Coccidiosis	17		17	
Colibacillosis	4		1	3
Conjunctivitis	1			1
Enteritis, unidentified	1			1
Enteritis, ulcerative	2		2	
Enterohepatitis	6	1	2	3
Gout, visceral	1	1		
Hemangioma	1			1
Injury, mechanical	4			4
Injury, debeaking	2		1	1
Laryngotracheitis, infectious	4			4
Leukosis complex				
neural	30		17	13
visceral	27		7	20
Management problem	1			1
Nephrosis	1			1
No diagnosis	12	2		10
Normal	10		2	8
Omphalitis	3	3		

Chicken Diagnoses (Continued)	Number of Diagnoses	0-4 weeks	4-20 weeks	20+ weeks
Paralysis, transient	1		1	
Paratyphoid	10	2	2	6
Paratyphoid negative	5	3	1	1
Pediculosis	2			2
Pullorum disease	1	1		
Pullorum disease called in:				
negative	23			23
positive	9			9
Respiratory infection, unidentified	5		1	4
Rickets	1	1		
Staphylococcosis	2		1	1
Starvation	1	1	1	
Synovitis, infectious	7		5	2
Traumatism	1	1		
Unfit for examination	2			2
Vaccination reaction	1		1	
Wound infection	1			1
Turkey Diagnoses (50 specimens)				
Airsacculitis	1	1		
Aneurism, dissecting	1		1	
Blepharitis	1			1
Colibacillosis	1		1	
Chronic respiratory disease	2		1	1
Enteritis, infectious	1	1		
Enterohepatitis	2		2	
No diagnosis	4	3		1
Normal	1	1		
Paratyphoid	1			1
Pullorum disease - called in negative	1			1
Respiratory infection	1			1
Duck Diagnoses (8 specimens)				
Paratyphoid	1			1
Geese Diagnoses (7 specimens)				
Lead poisoning	1			1

Miscellaneous (46 specimens)

	Total
Peafowl (1 specimen)	
Enterohepatitis	1
Pigeon (1 specimen)	
Impacted crop	1
Quail (14 specimens)	
Exposure	1
Sparrow (1 specimen)	
Mechanical injury	1
Guinea Pigs (1 specimen)	
Pneumonia	1
Mink (10 specimens)	
Cystitis, nephritis	2
Rabbits (18 specimens)	
Enteritis	1
Mucoid enteritis	1
Subcutaneous abscesses	1

Number of accessions	254	Poultry accessions (Chicken, Turkey, Duck, Geese)	248
Number of specimens	2901	Poultry specimens	2872

Report of the Large Animal Diagnostic Laboratory
January 1, 1966 - December 31, 1966

Accessions L1 - L252

Types of Examinations

Bacteriology	200
Hematology	20
Histopathology	52
Parasitology	73
Postmortem	143
Pregnancy	17
Serology	
Blood Agglutination	476
Mucus Agglutination	3
Serum Neutralization	200
Toxicology	15
Miscellaneous	
Animal Inoculation	13
Antibiotic Sensitivity	2
Entomology	1
Fluorescent Antibody Technique	37
Icteric Index	1
PPLO Culture	4
Rabies Examination (Mass. Dept. Pub. Health)	10
Semen Examination	1
Urinalysis	3
Urinary Calculi	1
Virology (Tissue Culture)	24

Diagnoses

Bovine (129 Accessions; 532 Specimens)

Abortion, beta streptococcus	1
" , coliform	1
" , *C. pyogenes*	1
" , *Leptospira spp.* (F.A.)	6
" , leptospirosis suspicious	1
" , *Listeria monocytogenes*	1
" , non-specific	22
" , twins	2
Blood culture - negative	1
Calf septicemia (colibacillosis; calf scours)	3
Enterotoxemia, presumptive	1
Fecal culture - negative for salmonella	2
Icterus, unknown etiology	1
Joint fluid culture - negative for anaerobes	1

Bovine Con't.

Mange, *Chorioptes bovis*				2
Mycology - negative for ringworm				1
Myositis, eosinophilic				1
No diagnosis				6
Parasitology - negative				1
Pneumoenteritis				4
Pneumonia, *P. hemolytica*				1
Poisoning, arsenic				1
" , lead				1
" , nitrates				1
Preputial swab culture - negative for pathogens				1
Respiratory infection, unidentified viral agent				2
Serology	Pos.	Susp.	Neg.	
Leptospirosis blood agglutination	19	10	379	408
Vibriosis mucus agglutination			3	3
IBR serum neutralization	22		88	110
BVD serum neutralization	48		42	90
Shipping fever				1
Stillborn, dystocia				1
Teratoma				1
Toxicology - negative				5
Unsatisfactory specimen				1
Urine culture - negative for leptospirosis				10

Ovine (20 Accessions; 30 specimens)

Abscess, *C. pyogenes*	1
Arthritis, suppurative, *C. pyogenes*	1
Colibacillosis	1
Hematoperitoneum; injury	2
Hemonchosis	2
Listeriosis	1
Mastitis, *Corynbacterium spp.*	1
Milk cheese culture - negative for Brucella	1
Mouth swab - culture negative	1
No diagnosis	3
Normal	1
Pneumonia, *P. hemolytica*	1
" , hemorrhagic	1
Pododermatitis, negative for fungi	1
Semen, normal	1
Serology	
Leptospirosis blood agglutination - negative	4
Stillborn	1
Unsatisfactory specimen	1
Urolithiasis	1

Caprine (6 accessions; 7 specimens)

Abscess, sternal, *C. pyogenes*	1
Anemia, undetermined origin	2

Caprine Con't.

Meningoencephalitis	1
Parasitology - negative	1
Parasitology - negative for mites and parasites ova	1
Poisoning, arsenic	1

Porcine (23 accessions; 70 specimens)

Abortion, coliform				1
Bone marrow, culture negative for pathogens				1
Edema disease				1
Hypoglycemia, (presumptive)				1
Lyngworms with pneumonia (*P. multocida*)				2
Meningitis, *S. enteriditis*				2
Milk fever, presumptive.				1
Necrobacillosis, presumptive - culture negative				1
No diagnosis				1
Parasitology negative				1
Pneumonia				1
Salmonellosis, *S. typhi-suis*				1
" *S. typhi-suis* and *S. st. paul*				1
Serology	Pos.	Susp.	Neg.	
Leptospirosis blood agglutination	5	6	50	61
"Shivering" pigs				2
Unsatisfactory specimen				1

Equine (34 accessions; 69 specimens)

Abortion, non-specific	1
" , *Str. zooepidemicus*	2
Abscess, hemolytic staphyloccus	1
" , non-hemolytic staphyloccus	1
Ascariasis	5
" and strongylidosis	6
Cervical swab - culture negative for pathogens	4
Hematology, leucopenia	1
" , lymphocytosis	1
" , neutrophilia	1
" , normal	2
Mycology, ringworm negative	1
No diagnosis	2
Poisoning, lead - chronic	1
Pregnancy test, mouse biologic - positive 12; negative 5	17
Serology	
Leptospirosis agglutination test - negative	3
Strongylidosis	26
Unsatisfactory	1
Urinalysis - normal	1

Canine (15 accessions; 15 specimens)

Cystic endometrial hyperplasia	1
Dermal cysts	1
Hematuria	1
Hemorrhage, pulmonary	1
Parasitology - negative for ringworm	1
Toxicology - negative	1
Tumors:	
Adenocarcinoma	3
Adenoma, perianal gland	1
Basal cell carcinoma	2
Histiccytoma	1
Melanom	1
Sebaceous gland carcinoma	1

Feline (1 accession; 1 specimen)

Liposarcoma with concomitant inflammation	1

Bat (5 accessions; 5 specimens)

Rabies negative (Mass. Dept. Pub. Health)	5

Chinchillas (2 accessions; 5 specimens)

Ketosis (presumptive)	5

Chipmunks (3 accessions; 7 specimens)

Cecal hemorrhage, unknown etiology	1
No diagnosis	1

English Deer (1 accession; 1 specimen)

Toxicology - negative	1

Fox (1 accession; 1 specimen)

Rabies negative (Mass. Dept. Pub. Health)	1

Guinea Pig (2 accessions; 12 specimens)

Streptococcosis	1
Toxicity, penicillin	9

Rabbit (1 accession; 1 specimen)

Pasteurellosis	1

Monkey (1 accession; 1 specimen)

Negative for tuberculosis	1

Opossum (1 accession; 1 specimen)

Multiple fractures	1

Polar Bear (1 accession; 1 specimen)

Autolysis; negative for pathogenic anaerobes	1

Racoon (2 accessions; 2 specimens)

Rabies negative (Mass. Dept. Pub. Health)	2

Rat (1 accession; 1 specimen)

Pneumonia, *D.* pneumoniae	1

Skunk (2 accessions; 2 specimens)

Rabies negative (Mass. Dept. Pub. Health)	2

Miscellaneous (1 accession; Many specimens)

Insect identification - meal moths	1

Summary of Salmonella Isolates Obtained from Specimens Submitted to Diagnostic Laboratories at Waltham and Amherst and Those Isolated from Tested Flocks During the Calendar Year 1966

Salmonella	Chicken	Turkey	Duck	Misc.[1]	Pig	Dog	Rat	Total
anatum		2	1					3
blockley	1							1
braenderup	1							1
derby			1					1
enteritidis					1		1	2
heidelberg	4							4
infantis	6					1		7
kentucky	1							1
montevideo	2							2
muenchen				1				1
newport		2						2
pullorum - diagnostic	2							2
tested flocks	4							4
saint paul					1			1
thompson	1							1
typhimurium	5		1	8			1	15
typhimurium var. copenhagen				1				1
typhi suis					2			2
group B, non-motile			1					1
Arizona		1						1
Total	27	5	4	10	4	1	2	53

All isolates reported on a farm basis. [1]Cowbirds, sparrow, pigeons, partridge.

Three of the poultry salmonella isolations were from out-of-state flocks. Salmonella blockley was recovered from a chicken flock in Connecticut, S. anatum was recovered from a turkey flock in New Hampshire, and S. thompson was recovered from cull chicks submitted by a Connecticut breeder from a farm in Canada.

From one turkey consignment both S. anatum and S. newport was recovered. From one duck farm S. anatum, S. derby, S. typhimurium, and a group B non-motile salmonella was isolated. Both S. saint paul and S. typhi suis were isolated from one swine consignment, and both S. enteritidis and S. typhimurium were recovered from a rat.

S. pullorum was recovered from two commercial egg flocks and from four tested fancier flocks.

Salmonella (paratyphoid) isolations were made from 6 chicken breeding flocks and from 1 turkey breeding flock. From chickens there were two isolations of S. heidelberg and four isolations of S. typhimurium; from the turkey flock both S. anatum and S. newport were recovered. Litter samples were submitted from two of the chicken flocks and the same paratyphoid was isolated from the litter as had been recovered from the birds.

COLLEGE OF AGRICULTURE

1966-67

SECTION V -- SPECIAL PROGRAMS

MANAGEMENT INFORMATION SYSTEM

COMMUNITY DEVELOPMENT

INTERNATIONAL AGRICULTURAL DEVELOPMENT

CIVIL DEFENSE TRAINING

RURAL CIVIL DEFENSE (STATE)

REGIONAL RURAL CIVIL DEFENSE (FEDERAL)

COLLEGE OF AGRICULTURE

MANAGEMENT INFORMATION SYSTEM

Massachusetts, along with California, Iowa and North Carolina, is participating in a pilot program in cooperation with the United States Department of Agriculture and the Systems Development Corporation to develop, test and implement a nation-wide management information system for cooperative extension work.

While computerized systems development has had broad use in industrial, military, space and business operations, it is a pioneering effort to attempt to apply systems development concepts and computer technology to the management information and reporting needs of an educational organization such as extension. Extension is a complex national effort that includes a federal department, 50 states and 3,300 counties.

The target date for completion of the design, development and testing of the system at the county and state levels in the pilot states, and for the aggregation and conversion of data at the federal level is June 30, 1967.

It is anticipated that the system will provide management with a measure of resources expended, in both dollars and manpower, in major program areas. In addition, the system will provide a measure of the size and type of audience and the contribution of individual staff to program objectives.

It is expected that such information will be of considerable value in determining and planning the use of available resources, and identifying and supporting future needs.

COLLEGE OF AGRICULTURE

"COMMONWEALTH '99" (COMMUNITY DEVELOPMENT PROGRAM)

Higher Education Act of 1965

Department of Environmental Sciences

"Commonwealth '99" closely fits the merging State concept of Title I of strengthening local government.

Its method is to provide local officials, volunteer committee leaders in government and in private activity, and concerned individual citizens with an understanding of environmental problems, and to offer assistance in applying this understanding in community action.

The threefold objective of this action is (1) the preservation of natural resources; (2) the gradual elimination of waste, pollution and depletion; and (3) an improvement in community planning for these and other ends.

Major activities and accomplishments during the past year included:

Formal courses in Air Pollution, Water Pollution, and Conservation.

A seminar on Mystic Valley Pollution Problems, and leadership of a seminar on Air Pollution in Boston, followed by guidance and evaluation of the Boston City Council hearing on air pollution.

Participation in the Oliver Wendell Holmes Association Program in "Our Urban Environment." Sponsorship of an air pollution display at the Massachusetts Spring Flower Show. The design and direction of a weekly radio program, "You and Your Environment."

The establishment of the Environmental Information Center at the Waltham Field Station with staff assistance plus two volunteers.

Future Plans

Formal courses in Pollution, Preservation of Resources, and the Mechanisms of Comprehensive Planning to be held at the Waltham Field Station and in communities under such local sponsorship as Adult Education.

Cooperation in planning and execution of educational programs with major educational institutions.

Special cooperative programs for community leadership.

The development of the Environmental Information Center to include a branch in Boston to serve state and municipal government.

Consultation and guidance service to local public libraries who wish to set up Conservation shelves or rooms.

COLLEGE OF AGRICULTURE

INTERNATIONAL AGRICULTURAL DEVELOPMENT

Introduction

Considered in its most emphatic sense, the College of Agriculture's objective in conducting the International Agricultural Development Program is to help establish and develop institutions abroad to train people locally to solve their own unique agricultural problems rather than teaching foreign students American methods in an American institution.

The underlying desire in all countries is to improve the well-being of the people -- better diet, health and education. No country can achieve these goals unless a process of economic self-generation is set in motion. In every developing country, agriculture is a vital, if not the most vital, factor in this process of self-generation.

Program

The International Training Program of the College of Agriculture conducted in cooperation with the U. S. Agency for International Development (AID) and the U. S. Department of Agriculture has a threefold purpose:

1. To educate in the two-year Stockbridge School, the four-year curriculum, and the graduate school, a selected number of students from developing nations in the agricultural sciences.

2. To train, on a short-term basis, in cooperation with AID (State Department), the U.S.D.A. and various foundations, international participants who occupy administrative and supervisory positions in the Ministries of Agriculture, Natural Resources, Education, and Commerce of their respective countries.

3. To assist under an AID contract the Government of Malawi in organizing, expanding and improving the Agricultural Extension Service; in organizing and expanding an agricultural credit program; in reorganizing and improving the two-year School of Agriculture which trains Extension workers; in establishing a College of Agriculture; in providing lecturers at the College of Agriculture; and in training nine native Malawians in the four-year course at the University for teaching and research assignments in the Agricultural College of the University of Malawi.

Academic Program

The following table shows the College of Agriculture's enrollment of international students for 1966-67:

1. Stockbridge School

1	- Guyana	- Food Science
2	- Canada	- Plant & Soil Sciences
1	- Ecuador	- Veterinary & Animal Sciences
4	- Total	

2. B.S. Degree

1	- Ghana	- Plant & Soil Sciences
1	- Malawi	- Agricultural & Food Economics
5	- Malawi	- Plant & Soil Sciences
2	- Malawi	- Veterinary & Animal Sciences
1	- Malawi	- Agricultural Engineering
1	- Israel	- Agricultural & Food Economics
11	- Total	

3. Graduate School

India	- 14	Malaysia	- 1
Israel	- 1	Italy	- 1
Peru	- 1	Columbia	- 1
Philippines	- 4	Liberia	- 1
China	- 14	Greece	- 1
Australia	- 1	Jamaica	- 1
Canada	- 6	Nigeria	- 1
Korea	- 3	Trinidad & Tobago	- 1
Japan	- 2	Antigua	- 1
Mexico	- 1	Ryuku Islands	- 1
Hungary	- 1		
Uruguay	- 1	Total	- 59

Short-Term Academic Courses and Training

Courses prepared by the School of Home Economics and Agricultural Administration are being taught in human nutrition, rural youth leadership, Extension supervision and administration, Extension teaching, and farm skills.

Malawi, Africa

Extension Service - The development and efficiency of the Extension Service in Malawi has been described editorially "as the best Extension Service in Africa" by one Zambian newspaper.

This phase of the program came to an end on June 1, 1967. Four years of effort have resulted in the establishment of program planning procedures which blend the nation's goals, the subject-matter specialists' recommendations, and the needs of the local people; a personnel management plan; and a comprehensive training program for Extension workers. An organization of development committees, paralleling the Extension organization, has been established and will function in an advisory capacity.

Complete localization of the Malawi Extension Service will probably be completed in 1968 or 1969. H. Sidney Vaughan, who served two years as an Adviser to the field staff in Extension Administration and Supervision, returned to the University in May 1967.

Since Malawi is almost wholly dependent on its agricultural potential for achievement of its economic goals, Extension's initial effort was directed towards increased production.

The following table presents a record of Malawi's production accomplishments and an evaluation of the Extension effort.

Principal Agricultural Exports

Weight in '000 Lb.

Product	1963	1965	% Increase
Tobacco	31,000	50,000	60.7
Peanuts	35,890	50,000	39.3
Raw Cotton	17,790	36,000	102.3
Rice	4,300	6,000	39.5
Turkish Tobacco	70	212	202.8

Colby Agricultural School for Extension Workers - The advisory position here is scheduled to be phased out at the completion of Clarence H. Parson's tour in September 1967. The consensus among government officials in Malawi is that Professor Parsons has fulfilled his mission and objectives beyond expectations. Major accomplishments at the school include:

1. A basic requirement of a high school education for application.

2. In-service training programs conducted by the staff in program planning and Extension Methods at farm institutes, at district training centers, and at regional training centers.

3. Two years extensive training of two African counterparts who are now fully qualified to handle the Extension courses at the school.

4. Increased intake of students from 35 to 180 per year.

Agricultural Credit - Progress of the credit program in the past two years is reported as excellent. The University Adviser, Kenneth E. Boyden, working closely with Regional Agricultural and Extension Officers, introduced five pilot credit areas in the first three months. Loans were made through organized groups, such as farmers' clubs. The Adviser also devised simple credit forms, application forms, standard reporting forms for committee action, and bookkeeping procedures.

Probably the greatest contribution of the Adviser in the credit program has been the close working relationships established between his credit organization, the Extension Service, and the Farmers' Marketing Board.

The Extension Service cooperation was vital for proper screening of loans, distribution of supplies, and supervision of farmers during the growing season. The Farmers' Marketing Board's cooperation was needed for procurement of fertilizer, implements, spray materials and sprayers, and for the collection of loans at the markets.

Bunda College of Agriculture - At the beginning of the Malawi project it was discovered that the plans for this new college were being worked on by numerous separate agencies and there seemed to be a need for one man to coordinate plans for the physical plant, the curriculum, the faculty, equipment and supplies, and student intake. Dr. Denzel J. Hankinson of the College of Agriculture spent three months in Malawi as a short-term Agricultural Education Adviser in an attempt to accomplish this objective.

His report was a thorough piece of work and served as the stepping stone for subsequent events; namely, the establishment of a University of Malawi and the integration of Bunda College into that University.

Dr. C. J. Gilgut, a College of Agriculture plant pathologist, joined the staff of the new University of Malawi as Dean of Agriculture in April 1966. Working closely with the Vice-Chancellor of the University, the faculty of the University, and the Principal and staff of Bunda Agricultural College, Dr. Gilgut has been successfully meeting and solving problems pertaining to physical plant, curricula, faculty, necessary equipment and supplies, and the student intake for the college.

In September 1966, two professors from the College of Agriculture, Dr. Emmett Bennett and Evangel J. Bredakis, were assigned to the University of Malawi's College of Agriculture as lecturers in agricultural chemistry and biology, respectively.

Both of these men are doing excellent work, and are well liked and respected by the students. Dr. Bennett has been named Prefect-in-Charge of the Student Committees and Organizations and, in addition, is supervising the research and thesis work for the soil chemist at the Chitedze Agricultural Experiment Station who is presently working on his Ph.D. from Makerere College in Uganda.

A lecturer in Animal Science, Dr. Wallace G. Black, will go to Malawi in July for a two-year assignment, and a lecturer in Extension Organization and Methods in June 1968.

International Agricultural Studies Program

Charles W. Turner, Director, and Gilbert E. Mottla, Associate Director of the International Training Program, served on a College of Agriculture faculty committee chaired by Dr. John H. Foster, to study the feasibility of, and to make recommendations regarding the establishment of an undergraduate and graduate program in international agriculture. A proposal recommending such a program has been approved by the University Administration and Trustees. Three major study areas are involved: Agricultural Administration, Agricultural Technology, and International Agribusiness. Financial support of this program will be explored through talks with the State Department, Department of Health, Education and Welfare, and various foundations.

COLLEGE OF AGRICULTURE

CIVIL DEFENSE TRAINING

Appropriations

Fiscal Year 1964-65 -	$ 70,655.00
Fiscal Year 1965-66 -	69,942.00
Fiscal Year 1966-67 -	66,109.00

Personnel

Harold W. Perkins	- Coordinator, UECDTP
Sidney D. Pierson	- SMI-CDM Instructor, UECDTP
Mrs. Virginia A. Wesoloski	- Senior Clerk & Stenographer
Current Vacancy	- RMI-RDO Instructor, UECDTP

Students or Clientele Served

Students participating in this Civil Defense Training Program were representatives from industry, business, state and federal agencies, community school systems and community leaders.

Major Accomplishments

The University Extension Civil Defense Training Program has expanded from its inception in 1963 from an initial contract and scope of two training classes to the 1967 contract in which five training courses were conducted, as well as two areas for seminar training. This broad training area resulted in training larger numbers than in any previous fiscal year.

The philosophy of preparedness for emergencies, although an integral part of life, requires stimulation. Preparedness for emergencies and disasters as associated with the needs of Civil Defense have obviously been stimulated by world tensions and these interests are reflected in the expanded training being conducted within the UECDTP.

Training Classes Were Conducted in Shelter Management Instructor, Shelter Manager, Civil Defense Management, Radiological Monitor Instructor and Emergency Operation Simulation Training

Shelter Management Instructor

Seven Shelter Management Instructor courses were conducted during 1967. Increased emphasis for shelter planning and organization within government and state agencies and military installations contributed to highly successful training sessions. It was necessary to resort to training as a one-week 32-hour presentation rather than extended over evening sessions in order to present more courses. As a result of interst and demand, no recruiting problems were encountered in this area.

SMI Courses Completed

Location (Massachusetts)	Attendance	Certified
Otis AFB	23	22
Veterans Administration Hospital, Brockton	24	24
Westover AFB	34	30
Westover AFB	36	35
Kennedy Building, Boston	12	12
Fort Devens, Ayer	31	31
Topsfield CD Training Center, Topsfield	9	9

Shelter Manager

End-product training of Shelter Managers was a new addition to the 1967 contract. Contract provisions allowed for conduct of training by the University staff or by direct payment to graduates of the SMI course. It is anticipated that the SM training will become an extended function of the UECDTP regulated by purchase-hire contracts with individuals having successfully completed the SMI course.

SM Courses Completed

Location (Massachusetts)	Attendance	Certified
Veterans Administration Hospital, Bedford	14	12
Veterans Administration Hospital, Bedford	15	13
Masconomet Regional High School, Boxford	20	20
Westover AFB	13	13

Civil Defense Management

The most successful and noteworthy course conducted during this fiscal year was the Civil Defense Management course conducted for staff officials of the Massachusetts National Guard during the week of March 20 at the National Guard Armory in Boston. The Massachusetts National Guard has adopted a posture of military readiness to insure full and complete participation in Civil Defense emergencies consistent with their mission requirements.

CDM Courses Completed

Location (Massachusetts)	Attendance	Certified
Sector 1C Headquarters, Bedford	12	11
National Guard Armory, Boston	56	56

Radiological Monitor Instructor

A highly successful Radiological Monitor Instructor program was conducted by individual contract with instructors for the University of New Hampshire Rutgers University and the University of Massachusetts. All the RMI courses were conducted under a 32-hour one-week schedule.

RMI Courses Completed

Location (Massachusetts)	Attendance	Certified
North Junior High School, Pittsfield	18	13
Westover AFB	29	16
Kennedy Building, Boston	20	19
National Guard Armory, Boston	47	46

Emergency Operation Simulation Training

This was another new phase of training entered into during 1967. This training was unique in many respects in that it was entered into for the first time this year by participating universities after having been researched and developed by the Research Development Corporation.

EOST is a concept of operations whereby management of all community resources may be accomplished within an Emergency Operating Control Center employing principles of production control; whereby each emergency is reflected visually on a local city map and reactions such as movement of units of fire, police, medical health and welfare equipment may be observed by unit symbols placed on a local city map. In addition to the visual reference to all actions being taken by local government departments, it also allows the City Manager, Mayor or Chairman of the Board of Selectmen to observe and control community resources. This concept of operation by design, forces coordination between local government department chiefs, further emphasizing the need for a well-organized coordinated community effort in times of emergency from natural or man-made disasters.

Preparation and training for the Emergency Operating Exercise involves the movement of approximately 1,000 lbs. of equipment in the form of operational unit map boards, bulletin boards, etc. Approximately 350 man-hours are expended in preparation, training and conduct of an EOST.

The EOST was conducted in Lexington with approximately 35 personnel from local government participating. The exercise was considered successful and many features of the EOST concept are to be incorporated in the Town of Lexington's Emergency Operation plan.

Conferences for Elected Officials and Industry

Major emphasis was placed on conducting training courses during the fiscal year and as a result only four conferences were conducted as noted below:

Location	Conferences
State Office Building, Boston	45
Red Coach Grill, Middleboro	35
Jug End, South Egremont	24
Monsanto Chemical Company, Springfield	140

Public Relations

An intricate part of the Extension Program is the effort required to continually expand the services offered. In the Civil Defense Training Program this effort involves presentations of basic facts and information to large numbers of people so that they may intelligently analyze the needs of Civil Defense as related to their lives. This action is a continuing part of the program and over 1,000 people have been contacted by means of letters, brochures and participation as guest speakers in seminars and meetings of various organizations.

The most noteworthy endeavor was during January when four 30-minute television programs were presented on WYHN, Springfield. The shows were video taped during the week and presented at 1:00 P.M. each Sunday. The shows were slanted more towards natural disasters, state and local organizations and responsibilities by request of the sponsor. Each program was the interview type and films used were: "One Week in October," "Though the Earth Be Moved," (shown in two parts), and a Massachusetts Civil Defense Agency produced film concerning the Civil Defense Training Academy at Topsfield, Massachusetts. Estimated number of viewers each week was 40,000.

Future Plans

The University training program has become a training center for participants of many Office of Civil Defense operational areas. This requirement has been responsible for the increase from two areas of training in 1963 to seven during 1967, and the scope of contract for 1968 provides for nine different areas of participation by the University staff.

The University contract for 1968 will provide the following:

Shelter Management (Instructor)	- 4
Shelter Manager	- 4
Civil Defense Management	- 2
Radiological Monitor (Instructor)	- 2
Radiological Defense Officer	- 2
Planning and Operations	- 3
Conferences for Public Officials	- 2
Conferences for Business and Industry	- 2
Emergency Operation Simulation Training	- 2

COLLEGE OF AGRICULTURE

RURAL CIVIL DEFENSE

The Rural Civil Defense Program is aimed at helping people understand the danger, consider the alternatives, and make their own plans for protection from fallout on an individual and community basis. There are no organized formal education courses in Rural Civil Defense.

The objective in carrying out the Rural Civil Defense Education Program is to acquaint rural people and others in towns and small cities with measures they need to take to survive should the nation suffer a nuclear attack or accident or fallout from testing.

The program is designed to create an understanding by people of the nature of the threat and means of protecting themselves.

Major emphasis is placed on how to select and increase protection areas (shelters) for themselves and for livestock, and how to provide reserve supplies of food, water and medical supplies. The basic approach to the program is to incorporate applicable phases into on-going Extension programs.

Specific Educational Programs

1. The 4-H TV Action Club consists of a series of ten 30-minute programs designed to teach emergency preparedness to the youth of the nation. Four programs cover natural disasters - tornadoes, earthquakes and floods. One program nuclear explosions; three programs protection against fire, sun and snow; two programs deal with survival for indoor and outdoor emergencies. 4-H TV Action Club was viewed in the spring of 1967 on Channel 6 in New Bedford, and Channels 22 and 32 in Springfield. A total of 16,321 Massachusetts youngsters signed up for the series. Many more viewed the series but did not formally sign up.

2. Sixty senior officers of the Massachusetts National Guard and 25 members of industrial organizations in Massachusetts were given a briefing on how to incorporate fallout protection in new construction by employing "Slanting." Slanting is defined as the incorporation of certain architectural and engineering features into new structures to protect personnel from fallout gamma radiation in event of an emergency.

3. The Rural Civil Defense Specialist helps to create public awareness of the need for preparedness against possible disaster by conducting educational and lecture periods for:

   a. County Extension workers
   b. Retired workers' clubs
   c. Police organizations
   d. Boy Scouts
   e. Women's Clubs
   f. 4-H Clubs
   g. County Defense Boards

4. Surveys have been conducted by the Rural Civil Defense Specialist to determine the educational needs of a community and assist Civil Defense officials to tailor programs to fit these needs. Medical self-help courses and shelter living problems have been conducted in a specific community as a result of these surveys.

5. The Rural Civil Defense Specialist has designed and administered practice problems for use during Civil Defense practice alert and emergency action sessions in the area of radiological monitoring and fallout.

6. A monthly newsletter, "Rural Civil Defense Notes," is published carrying timely educational items relative to fallout protection and protection from natural disasters.

7. The Rural Civil Defense Specialist in cooperation with the chairman of the Massachusetts United States Department of Agriculture State Defense Board designed a training problem that was used by all Massachusetts County Defense Boards. The problem tested the County Defense Boards' ability to react under emergency conditions to insure the continuation of food production during emergencies.

Major Accomplishments

A 4-H Preparedness Club, assisted by the County 4-H Leader and the Rural Civil Defense Specialist, prepared a two-day exhibit at the Eastern States Exposition. The theme of the exhibit was "Preparedness for Disasters." The exhibit was viewed by 10,000 people and 6,900 pamphlets were distributed.

The Rural Civil Defense Specialist in cooperation with the State 4-H Club Leader and a science teacher compiled a Teacher's Guide to supplement the 4-H TV Action Club. The Teacher's Guide was designed to assist teachers in incorporating the weekly 4-H TV Action Program into the regular school curriculum. During the 10-week period that the 4-H TV Action Club was on the air, 3,471 teachers from 442 schools requested the Teacher's Guide.

The Rural Civil Defense Specialist in cooperation with the State 4-H Club Leader and the Massachusetts Safety Council conducted a one-day Safety Conference for high schools in the state. Delegates from 56 schools attended. Upon returning to their respective schools, delegates conducted safety programs during assembly periods.

Future Programs

Future programs will continue to emphasize preparedness education for rural people.

1. Promote 4-H TV Action Club on television stations within Massachusetts.

2. Promote an irradiated seed project through the 4-H programs.

3. Public monthly newsletters.

4. Publish emergency preparedness information sheets covering timely subjects concerning preparedness.

5. Speak to clubs and civic groups relative to preparedness.

6. Answer requests for information relative to fallout protection. Assist people in planning their community and house shelters.

7. Conduct an annual high school safety conference.

Personnel

The Rural Civil Defense Office consists of two people: The Rural Civil Defense Specialist George Vinsky; and a secretary, Louise Sherman.

The Rural Civil Defense Specialist heads an Emergency Preparedness Information Committee that consists of 12 members representing various disciplines, primarily in the area of agriculture.

Direct and close contact is maintained with County Extension staff, State Specialist, State and Local Civil Defense Directors.

Appropriations

Budget for fiscal year ending June 30, 1967:

Salaries	-	$16,740.00
Travel	-	1,400.00
Promote 4-H TV Action Club	-	8,000.00
Supplies	-	760.00
Miscellaneous Printing	-	500.00
Total		$27,400.00

Unexpected funds for fiscal year ending June 30, 1967 will be approximately $2,000.00.

COLLEGE OF AGRICULTURE

REGIONAL RURAL CIVIL DEFENSE PROGRAM

Preparedness for fallout or natural emergency must be part of the family's total farm, home and business planning. Extension agents and specialists make special effort to help rural people see the need for preparedness planning as they work with them on their total plans.

Rural Civil Defense (both regional and state) is an education program under the leadership of the Cooperative Extension Service by contract agreement with the Office of Civil Defense. Rural Civil Defense specialists have been added to each State Extension Service and the Federal Extension Service. Special staff training, publications, visuals and other materials are provided by the Department of Agriculture and Office of Civil Defense to help local Extension specialists and agents intensify and weave rural preparedness into their on-going educational efforts.

A Regional Rural Civil Defense Leader here at the University provides stimulation and coordination for rural civil defense and emergency preparedness educational activities for the 15 State Rural Civil Defense Specialists located in the Northeast Region. The Regional Leader also evaluates the activities of these 15 State Specialists to determine RCD program effectiveness in these states. Attention also is given to the working relationships within the State Extension Services, the technical aspects of subject matter, educational methods, the exchange of ideas, the development and initiation of pilot programs, and the testing of new ideas and methods. Assistance is given State Rural Civil Defense Specialists in maintaining working relationships with federal and state offices of Civil Defense, the United States Department of Agriculture and the Federal Extension Service.

Rural Civil Defense, in total:

1. Helps local Civil Defense officials explain operations to rural people to help them understand the need for community as well as family action.

2. Encourages someone from every family to take medical self-help, adult education and other preparedness training.

3. Assists local people and agencies operating preparedness training to recruit people for training.

4. Trains and helps thousands of local, farm, home and youth organization leaders to extend preparedness understanding and action in their communities.

Giving the facts to interested families and helping them plan further training and action has been relatively easy. Informing, motivating and changing attitudes of the many unconcerned, unaware or frightened families has been more difficult. A major approach to reach this latter

group has been to start where people are and use their knowledge of storms, floods and other natural disasters as a base for adding fallout protection in total preparedness planning. This has been the most effective motivation approach, yet.

Major Accomplishments

The Regional Program Leader was a developer of, speaker and resource person at the first one-week seminar for 21 new State RCD Program Leaders.

Two new positions were established in the states of the Northeast Region. A special RCD engineer has been located at the University of Maine to provide the necessary technical information needed by the State RCD Program Leaders. A position of RCD Information Specialist was established at the University of New Hampshire.

An innovative mobile campus has been created at the University of New Hampshire to show the benefits of living in the nuclear age. The vehicle known as the "University Show Bus" will be available this summer on a request basis for the State RCD Program Leaders of the six New England States plus New York and New Jersey.

The 4-H TV Action Club series of 10 half-hour educational presentations on emergency preparedness has attracted over 50,000 girls and boys for the eight Northeastern States during its first half-year of availability. For most states this is the first use they have made of the televised Extension youth project. The films and much of the printed material were financed and conceived by RCD.

Another tool which lately has been receiving national acclaim is the educational game. The "Community Response Game" was developed and produced federally with RCD funds. The "Game" has been designed for the educative stimulation of teen-age youth relative to citizenship opportunities in emergency situations. Thus far, since February 10 states have accepted this educational tool for youth conference and camp use.

An emergency preparedness self-teaching lesson series is being readied for the use of homemakers. The five units will each initially contain three lessons. All lessons have been field-tested in selected counties of several states.

The role of the Northeast Regional RCD Program Leader has been that of a catalyst for the development and utilization of each of the preceding educational activities. A large portion of the previous year's work has been devoted to initiation and development of the products of these projects.

The high proportion of change in State RCD personnel this year has made it necessary for the Regional Leader to be called for extensive and repeated consultations with new staff members. In five states there were eight transitions. The new appointees were given on-site guidance in their RCD education and information responsibilities. A basic understanding of the organization of the Rural Civil Defense Program also was provided, as well as guidance in interpreting existing plans of work, evaluation and preparation of new plans of work.

Future Programs

Continued stress will be placed on the maximum use of the existing 4-H TV Action Club series, the Community Response Game and the Homemakers' Emergency Preparedness self-teaching lesson series.

Additional innovative educational tools are now in the process of development and will be field tested next year. Among these new items are a teaching machine, a situation simulator, and programmed learning.

Personnel

Regional RCD Program Leader - John F. W. Schulze

Clerical Assistant - Louise Sherman

Being an innovative position for the Federal and the State Cooperative Extension Service, the role of the Regional Rural Civil Defense Program Leader is unique. The appointment is by a Cooperative Agreement between the Federal Extension Service and the Massachusetts Cooperative Extension Service. Administratively, the Regional Program Leader is under the supervision of the Director of the Extension Service. From the program standpoint, guidance for the Regional Program Leader is provided by two Federal Extension Service Rural Civil Defense Program Specialists. Four Regional RCD Program Leaders serve all of the 50 states and territories.

Appropriations

All funds are provided by the Office of Civil Defense, Department of Defense. The budget for the Regional RCD Program Leader Office at the University is:

Salaries		
Regional RCD Program Leader	-	$11,000.00
Clerical (1/2 time)	-	2,900.00
Travel		
Regional RCD Program Leader	-	5,400.00
Supplies	-	2,370.13
Printing	-	2,000.00
Total	-	$23,670.13

COLLEGE OF AGRICULTURE

1966-67

SECTION VI -- MISCELLANEOUS

COOPERATIVE PROGRAMS CONDUCTED WITH

OTHER SCHOOLS AND COLLEGES WITHIN AND

WITHOUT THE UNIVERSITY

DEPARTMENTAL ADVISORY COMMITTEES

COLLEGE OF AGRICULTURE

COOPERATIVE PROGRAMS CONDUCTED WITH OTHER SCHOOLS AND COLLEGES

WITHIN AND WITHOUT THE UNIVERSITY

AGRICULTURAL AND FOOD ECONOMICS

Bell, Ellsworth W.

Joint program with University of Vermont, University of New Hampshire, University of Maine, and University of Connecticut to develop and publish 1967 price estimates for Class I and producer blend prices for milk

Brown, Alfred A.

Cooperating with The Pennsylvania State University, University of Connecticut, and University of Maine on Transportation Subcommittee of Northeast Extension Marketing Committee

Bragg, John H.

Conducted two 5-day Financial and Expense-Control Workshops for milk dealers in cooperation with Richard D. Aplin of Cornell University and William T. Butz of The Pennsylvania State University
Conducted 3-day Financial Planning and Control Workshop for Directors of farmer-owned cooperatives with Springfield Bank for Cooperatives
Conducted 2-day Budgetary Expense Control Workshop for milk dealers in New York City with Richard D. Aplin of Cornell University

Crossmon, Bradford D.

Served as Visiting Scientist to Agricultural Experiment Station at University of Puerto Rico in summer of 1966, with responsibility of appraising research of Department of Agricultural Economics and Rural Sociology. Following this, taught course, Advanced Management of Agricultural Firms, in summer school at University of Puerto Rico. Dr. Crossmon will continue this association in summer of 1967.

Fitzpatrick, Robert A.

Teaches marketing at Holyoke Community College

Foster, John H.

Teaches water quality economics to civil engineers in program supported by U. S. Public Health Service
Teaches short-course program for Agency for International Development trainees - three groups
Cooperated with Cornell University in teaching Peace Corps trainees

Fuller, Earl I.

Participated in regional projects, farm management research, dairy adjustment and NE-43R

Jarvesoo, Elmar

Cooperates on interdisciplinary course OH-265, Soviet Perspective Lectures on Agriculture in the Soviet Economy

Leed, Theodore W.

Serves as consultant to Supermarket Institute in their management training series
Taught Extension course at University of Puerto Rico, summer 1966

Rhoades, Lawrence D.

Served with Northeast Farm Management Extension Committee, and as member of Board of Directors of ELFAC and secretary-treasurer during 1966-67
Member, ELFAC Executive Coordinating Committee, Northeastern Cooperative Extension Services Management Education Information Program

Russell, Sargent

Northeast Marketing Subcommittee NEM-25, drawing up new regional project in milk marketing

Spindler, Herbert G.

Teaches Intermediate Accounting at Greenfield Community College

Storey, David A.

Regional projects NEM-37 and NEM-21

Wyckoff, J. B.

Participated in committee to establish Interdisciplinary Regional Planning Curriculum
Participated in two-day planning conference with University of Maine relative to planning their program in New England Center for Continuing Education, Durham, N. H., in resource development.

AGRICULTURAL ENGINEERING

Clayton, J. T.

Organized and conducted, in cooperation with School of Engineering, series of four colloquia entitled, "Interactions Between Engineering and Biological and Agricultural Sciences." The papers presented, two by noted outside speakers and two by U-Mass faculty members, will be published in a Proceedings.
Participated as technical committee member of Northeast Regional Research Committee

Johnson, Ernest A.

Participated as technical committee member of Northeast Regional Research Committee

Light, Robert G.

Cooperated with other Extension Engineers in Northeast in further revitalizing the Northeast Plan Exchange
Cooperated with J. A. McCurdy, The Pennsylvania State University, and W. W. Irish, Cornell University, in preparation of a regional bulletin on "Ventilation of Insulated Dairy Structures"

Whitney, Lester F.

Participated as technical committee member of Northeast Regional Research Committee

Zahradnik, John W.

Appointed to Graduate Faculty, Department of Mechanical and Aerospace Engineering, U-Mass
Presented one of four invited papers at Colloquia on Interactions Between Engineering and Biological and Agricultural Sciences
Participated as technical committee member of Northeast Regional Research Committee

CRANBERRY STATION

Graduate student from University of Minnesota carried out and completed thesis requirement for Ph.D. in East Wareham laboratory

ENTOMOLOGY AND PLANT PATHOLOGY

Holmes, Francis W.

Cooperative research in NE-25 with eight other Northeastern States, plus USDA-ARS and USDA-USFS

Shaw, Frank R.

Participated in NE-36 Regional Research Program

Wheeler, Ellsworth H.

Active in cooperative programs as Vice Chairman, Northeastern Pesticide Coordinators' Organization, and member of Ground Applicator School Task Force

ENVIRONMENTAL SCIENCES

Feder, William A.

Cooperative research programs are currently in progress with several (L. Kaplan and S. Robrish) of the U-Mass--Boston staff
Cooperative research-training program with Thayer Academy on pre-college science education for advanced students

Galinat, Walton C.

Cooperative research programs are currently in progress with several (L. Kaplan and S. Robrish) of the U-Mass--Boston staff
Cooperative research program with Bussey Institute, Harvard University, for maize genetics and graduate training. As a result of this co-operation, one more Ph.D. degree has been awarded by Harvard University.

Gunner, Haim B.

Cooperated with Department of Plant and Soil Sciences, University of Connecticut, on Environmental Control of Soil-Borne Plant Pathogens
Public Health Service grant: Pesticide Occurrence, Concentration and Degradation in Free Water Systems (Water Resources Research Center Program)
Cooperative Graduate Student Programs with Department of Public Health are participated in by our staff

Hemerick, Glen

Cooperative research-training program with Thayer Academy on pre-college science education for advanced students

Litsky, Warren

Cooperative research project with Clark University under the sponsorship of Water Resources Research Center entitled "The Ecological Significance of Cellulolytic Bacteria in Quabbin Reservoir"
Principal Investigator of Water Resources Research Center WR-18 entitled "Arrest of Aging Process in Massachusetts Lakes Resulting from Man's Activities" in cooperation with School of Engineering, University of Massachusetts, and Department of Biology, Clark University
Member, Advisory Council of Water Resources Research Center, University of Massachusetts
Member, Advisory Committee on Marine Science, Graduate School, University of Massachusetts

McEnroe, William D.

Cooperative research-training program with Thayer Academy on pre-college science education for advanced students
Cooperative foreign student training program with Polish Student Exchange; currently, Dr. Antoin Lakocy is studying with us.

McEnroe, William D.

Cooperated with Lincoln College, New Zealand, in having Dr. Roy Harrison, Head, Department of Economic Zoology, studying with us

Naegele, John A.

Cooperative foreign student training program with Polish Student Exchange; currently, Dr. Antoin Lakocy is studying with us.
Cooperated with Lincoln College, New Zealand, in having Dr. Roy Harrison, Head, Department of Economic Zoology, studying with us

FOOD SCIENCE AND TECHNOLOGY

Clydesdale, F. M.

Cooperated with Dr. Fred Billmeyer, Rensselaer Polytechnic Institute in standards for colorimetry

Fagerson, Irving S.

Carried on informal cooperative program with Dr. Erik von Sydow of Swedish Institute for Food Preservation, Goteborg, Sweden, on analysis of volatiles in cranberries

Francis, Frederick J.

Cooperated with Dr. Fred Billmeyer, Rensselaer Polytechnic Institute in standards for colorimetry

Hayes, Kirby M.

Acted as technical consultant to Essex Agricultural and Technical Institute in planning and designing of new building and facility for training of food technicians and other food workers

Levin, Robert E.

Served as advisor to Dr. T. H. Feng, School of Engineering, University of Massachusetts, on U. S. Army contract concerned with "Effects of Chemical Impurities in Water on Disinfection by Halogens"

Lundberg, Donald E.

Served as educational consultant to University of Guelph, Ontario, Canada, in establishment of new School of Hotel and Food Management
Invited to help Hotel School of University of Puerto Rico establish a college level program

Sawyer, F. Miles

Served as advisor to Dr. T. H. Feng, School of Engineering, University of Massachusetts, on U. S. Army contract concerned with "Effects of Chemical Impurities in Water on Disinfection by Halogens"

FORESTRY AND WILDLIFE MANAGEMENT

The Department continues to work cooperatively with Zoology and Botany in the execution of graduate programs, research and extension.
The Department is also a participant in three regional research projects involving the Northeastern Agricultural Experiment Stations.

Carlozzi, Carl A.

Holds a nonresident senior research associateship at Caribbean Research Institute, Virgin Islands, and has served as director of two Institute projects on resource conservation in the Lesser Antilles

LANDSCAPE ARCHITECTURE

Instituted a cooperative exchange program with Division of Architecture, Hampton Institute, Hampton, Va. The program is set up with each institution acting as host on alternate years. It involves first year graduate students in landscape architecture from the University of Massachusetts and fifth year architecture students from Hampton Institute. Each year the students are brought together for a two week intensive collaborative design problem. November 1966

4-H AND YOUTH PROGRAMS

Boss, Marvin W.

Acted as advisor to Boston University Human Relations staff and Camp Fire Girls regarding Metropolitan Critical Areas Project being developed in Boston

Howell, Mildred L.

Participated in Massachusetts Department of Education, Boston, Citizenship Short Courses at State Colleges
Conducted program for Department of Public Health, University of Massachusetts as follows: Health Education Program in Greenfield High School, 749 pupils; Health Education Program in Hampden County, 50 adults and members

Metcalfe, William W.

Taught graduate course in School of Education, Administration of Adult Education, Educ. 964, 9 students
Directed 14 afternoon enrichment programs for State 4-H Conference involving 11 faculty members from the College of Arts and Sciences, School of Engineering, School of Physical Education, and Department of Public Health

PLANT AND SOIL SCIENCES

New England Fruit Meetings

This two-day event was held for those interested in deciduous tree fruit production, fresh fruit storage management, and marketing. Professional men from six New England States Land-Grant Universities were involved in formulation and participation in this program, as well as faculty from the College of Agriculture. In addition, faculty from Cornell University, Michigan State University, University of Maryland, and representatives from Ocean Spray Cranberries, Inc., and Arthur D. Little, Inc., presented papers during the sessions. Approximately 450 people attended the sessions.

Turf Conference

Over 600 people attended this two-day program related to turfgrass response to nutritional, pesticidal, and environmental factors. Our faculty, plus research men from Michigan State University, University of Maine, The Pennsylvania State University, Rutgers University, and Iowa State University, participated in what is now recognized as one of the outstanding Annual Turf Conferences held in this country.

VETERINARY AND ANIMAL SCIENCES

Black, Donald L.

Has a continuing cooperative program with Dr. David Armstrong, Harvard University. Harvard University supported the Post-Doctoral Program of Dr. Gustavus Currie until January 1, 1967.

Also, has participated with Dr. James Snedecor, Zoology, and Dr. Anthony Gawienowski, Biochemistry, in obtaining a N.I.H. Traineeship in Mammalian Reproduction. This grant will provide $250,000 to the University for the next five years for the support of graduate education in the area of Physiology of Reproduction.

COLLEGE OF AGRICULTURE

DEPARTMENTAL ADVISORY COMMITTEES

ENTOMOLOGY AND PLANT PATHOLOGY

Committee of Tree Wardens, Arborists and Utilities Conference

Lloyd Allen
New England Telephone & Telegraph
Boston

Joseph Beasley
Massachusetts Department of Public Works
Boston

Carlton Brown
Rockport

Ellis Allen
Medfield

A. T. Hanson
Electric Council of New England
Boston

J. Matis
Holden

Harold Pomeroy
Electric Council of New England
Boston

Otto B. Vogel
Boston Gas Company
Boston

Committee of Eastern Conference of National Pest Control Association

R. L. Keenan, Chairman
Waltham

W. T. Blank, Vice Chairman
Poughkeepsie, N. Y.

C. W. Houghton, Treasurer
Boston

G. Blum
New Haven, Conn.

A. L. Brody
New York City

R. W. Burgess, Sr.
New Haven, Conn.

C. A. Chafe, Jr.
Wollaston

K. N. Cook
Worcester

R. W. Kelley, Jr.
Hartford, Conn.

H. Ratner
Atlantic City, N. J.

T. A. Sheehan
Boston

ENVIRONMENTAL SCIENCES

"Commonwealth '99" Advisory Committee (Educational Program for Resource Development

John S. Bottomly
(Former Assistant Attorney General)
Boston

Chancellor John W. Ryan
University of Massachusetts
Boston

Charles E. Roth
Massachusetts Audubon Society
(Director, Hathaway School of Education)
Lincoln

Peter Siegle
Center for Study of Liberal Education for Adults
Brookline

John T. Howard, Head
Department of City & Regional Planning
Massachusetts Institute of Technology
Cambridge

Joseph J. Harrington
Harvard School of Public Health
(Population Center, Harvard)
Boston

Oliver F. Ames
Massachusetts Legislature and President of Massachusetts Horticultural Society
Boston

James Mosely
Boston Safe Deposit & Trust Company
(Conservation Enthusiast)
Boston

Benjamin W. Nason
Massachusetts Forest and Park Association
Boston

Mrs. Franklin Sanders
(Conservation Leader)
Wellesley

James B. Ayres
City Desk, Boston Globe
(Conservation Editor, Nieman Fellow)
Boston

FOOD SCIENCE AND TECHNOLOGY

Restaurant and Hotel Management Industry Advisory Council

Robert N. Appleton, Manager
Algonquin Club
Boston

Alexander Armour
McLean Hospital
Waverly

Ray Byrnes
Howard Johnson's
Wollaston

Thomas A. Culbertson
Seilers Caterers, Inc.
Boston

Edward R. Dickhaut
State House
Boston

Harold R. Dolby
"Hotel and Restaurant News"
Boston

Norman R. Grimm
Brandeis University
Waltham

Foster H. Gurney
Sheraton Building
Boston

Carl E. Jensen
Waldorf System Incorporated
Boston

Paul Kennedy
Holiday Inn
Leominster

Roger Marshall
Lexington

B. E. Nordhielm
Carling Brewing Company
Natick

Robert D. Parks
Howard Johnson's
Wollaston

Stephen Sonnabend
Sommerset Hotel
Boston

Mark Strong
Massachusetts Restaurant Association
Boston

Eugene Tamburi
Yankee Pedlar Inn
Holyoke

Andrew Vitali
Mt. Holyoke College
South Hadley

Charles C. Wallace
Wellesley College
Wellesley

M. A. Zugger
Statler-Hilton Boston
Boston

FORESTRY AND WILDLIFE MANAGEMENT

Industrial Advisory Council in Wood Technology

George P. Alderman
Adams Plastics Company
Holyoke

William E. Aubin
William E. Aubin, Inc.
Amherst

Warren V. Baker
Draper Corporation
Hopedale

Laurence Barbieri
Barbieri Lumber Company
Housatonic

John E. Bent
S. Bent & Bros., Inc.
Gardner

Paul H. Graham
Clinic of Wood
Newfane, Vt.

Everett P. Grossman
L. Grossman & Sons
Braintree

Robert E. Gunter
Arthur F. Tyler Sales Company
Athol

Joseph E. Gurvitch, Jr.
J. E. Gurvitch Lumber Company
Springfield

Gordon Hutchinson
Sprague & Carleton, Inc.
Keene, N. H.

John Kelly
Kelly Hardwood Corporation
Pittsfield

N. Carl LoCascio
New England Millwork Distributors, Inc.
Dorchester

Charles R. O'Connor
O'Connor Lumber Company, Inc.
Westfield

Frank T. Parrish
Heywood-Wakefield Company
Gardner

William A. Rhodes
Sharon Box Company, Inc.
Sharon

Joseph G. Roy, III
J. G. Roy Lumber Company
Chicopee

Eliot I. Snider
Wood Fabricators, Inc.
Cambridge

John W. Tebbets
Ekso Tebbets, Inc.
Locke Mills, Me.

Henry Towers
Pratt, Read & Company
Ivoryton, Conn.

Walter Webb
Warren Trask Company
Boston

Charles N. Wysong
Holbrook Lumber Company
Springfield

Massachusetts 4-H Foundation, Inc. Advisory Committee

Officers: One-Year Term

Mrs. Irene Wright, President
Brimfield

Judson Pierpont, Vice President
(Assistant Secretary,
Federal Land Bank)
Springfield

George Mullen, Secretary
(General Manager,
Belknap and McClain)
Watertown

Robert McCarter, Treasurer
(President,
Amherst Savings Bank)
Amherst

Directors: Term Expires in 1968

Harry Baldwin, III
(Vice President,
New England Merchants Bank)
Boston

Richard Brickley
(Partner,
Brickley, Sears and Cole)
Boston

John W. Haigis, Jr.
(Trustee,
University of Massachusetts)
Amherst

Clifford Jones
(Director of Public Relations,
Hotel Corporation of America)
Boston

Robert Luke
(Assistant Treasurer,
Norfolk & Dedham Mutual Fire
Insurance)
Dedham

John C. McFarlane
(Vice President, Massachusetts
Society for Prevention of
Cruelty to Animals)
Boston

Mrs. Elbridge Rathbone
(Director,
Rathbone Company)
Palmer

James Reynolds
(Assistant to the President,
Harvard University)
Cambridge

James T. Timberlake
(Director, Agricultural Relations
Federal Reserve Bank)
Boston

Mrs. John A. Volpe
(First Lady,
State of Massachusetts)
Winchester

Directors: Term Expires in 1969

Warren Arnold
(Manager,
F. S. Moseley and Company)
Worcester

Miss Julie Chase
(Announcer, Station WTAG)
Worcester

Robert Chavenson
(General Manager,
Ann Dale Products, Incorporated)
Fall River

Charles Chunglo
(Director of Public Relations,
Western Massachusetts Electric Company)
West Springfield

Paul Corson
(Secretary,
Massachusetts Fairs Association)
Topsfield Fair Grounds
Topsfield

Harry Grant
Bridgewater

Charles H. McNamara
(Commissioner of Agriculture,
Commonwealth of Massachusetts)
Boston

Frank Nelson
(Master,
Massachusetts State Grange)
Athol

Philip M. Read
(Regional Director,
The Sears-Roebuck Foundation)
Boston

Clarence E. Scott
Springfield

Directors: Term Expires in 1970

Thomas G. Brown
(Vice President,
State Street Bank and Trust Company)
Boston

Nathan Chandler
(Trustee, Massachusetts Society for
Promoting Agriculture)
Sterling Junction

Mrs. Archibald Cox
(4-H Volunteer Leader)
Wayland

John W. Ewell
(Vice President,
The First National Bank of Boston)
Boston

Warren A. Ellsworth
(Trustee,
The Charles A. Harrington Foundation)
Worcester

Eastman Heywood
(Executive Secretary,
Charles H. Hood Foundation)
Boston

John Sanders
(4-H Volunteer Leader)
Westford

Geoffrey Stanwood
(Director of Public Relations,
First National Stores)
Somerville

Norman Walker
(President,
Walker Poultry Farm)
New Braintree

Dean K. Webster
(Vice President,
H. K. Webster Company)
Lawrence

A N N U A L R E P O R T

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SCHOOL OF BUSINESS ADMINISTRATION
UNIVERSITY OF MASSACHUSETTS

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School of Business Administration
University of Massachusetts

PROLOGUE

Since this Annual Report is my last one I do not believe there is need to be anything but brief (for me). The philosophy and educational policy of this School should be fairly well known by now in so far as annual reports have expressed them. I pass from the difficult earlier years beginning with 1957 and stretching into nearly 1964 when the School of Business was more or less ignored, abandoned and considered tenth rate, more or less to the time when it achieved a semblance of recognition, support and administrative support. All this was happening while the School was increasing in stature outside the University and our faculty was promoting, not only good teaching, but projects for research and publication. May I state now that the team of President Lederle--Provost Tippo became the finest I have ever known in my academic career and began a renaissance in scholarship, selection of excellent faculty and created an atmosphere of human decency and respect that I shall never forget. But I cannot distribute only praise. That would not be academic cricket and would be unbecoming a Dean who always wants a lot more than he is likely to receive.

This is the place to emphasize the future of this School, under another Dean no matter what stamp his personality and behavior puts upon the School. Certain needs are essential and insistent. I have emphasized them in my budget for fiscal, 1969. I can do no better than repeat the statements here:

> "The need to begin thinking seriously of a new building, primarily for graduate programs. The need will be desperate within two or three years. Why we cannot even get a new building on the priority list is a wonder to me. Fortunate for us and the whole University that we have our present building. Where would the College of Arts and Sciences be if it were not for us? I am happy to have aided them in their need for space. But who is there to promote a building for us? Must we wait until the situation is desperate? My chief wish now is to have the Master Planning Committee to recognize the needs of the School of Business Administration. Until that

happens it will never get to the General Court as a Capital Outlay. After that the School, as any other School or College, must take its chance for funds. But at least our people here should recognize the need."

"The need for a Library to replace our Reading Room is another item too often delayed. I feel terrible about this and feel terrible that a new Dean must come here knowing how deficient we are in library resources and to know how deficient we are in the University Librarians that know almost nothing about a School of Business Administration. The vast amount of money spent for books in other areas of the University stands in mute silence to the neglect of our area of intellectual concern, physical facilities, and research accommodations. As in Capital Outlay for the future I feel I have been magnificently unsuccessful in convincing anyone that library facilities in the School are outrageously poor. We have no real friends in Goodell. We have no one there willing to recognize our needs. This lack should be speedily remedied. It is fine that the School has been able to attract excellent faculty, but the deficiencies in library funds and help shows up only too glaringly the stronger we are and hope to be."

Please Note: A decision has been made to convert our Reading Room into a Divisional Library. I have left the above statement in this report only for the record, in this case, a record of progress.

Although I have lost most of my resentment concerning that overwhelming giant, the College of Arts and Sciences, I still feel that too much time and too much energy and too much attention is paid that College. One would get the idea, in discussing capital outlay for buildings, that the only ones to be considered are the inmates of Arts and Sciences. I have as much devotion to the liberal arts philosophy as anyone but there is a vast difference between the support of the liberal arts and the allocation of resources. Vested interests are vested interests and internal politics are played as effectively by those purporting to "broaden the mind" as those who claim a professional objective. In the final upshot of dramatic and fiery speeches proclaiming the glories of the Humanities I have yet to discover a faculty member in the College of Arts and Sciences who is not as concerned with pay, promotion and tenure as anyone touched by the corrupting hand of a professional interest.

I mention these matters only because one might get the idea that the problems of enrollment in the University, or the completion of buildings, or the effectiveness of the Administration or communication are the exclusive property of Arts and Sciences. Indeed it almost appears so, what with considering the Fine Arts Building, Machmer Tower, the Graduate Center (exclusively fields in Arts and Sciences), the new Library (exclusively the same areas) and Bartlett East and West and what have you. With such affluence I have no quarrel, but I do have a quarrel with the almost exclusive allocation of funds for all this while showing so little concern for Business Administration and no doubt other professional areas. Must I repeat that we are a University?

And thus does an old, battered Dean leave his post, both with joy at being at the University and with joy at having made some contribution to its advancement, but with sorrow in not accomplishing all that might have been accomplished and having left a new Dean plenty to do.

I think I leave a fairly strong faculty, a strong trend toward faculty participation in major School affairs, a dedicated group of Chairmen, an increasing urge to promote scholarship and teaching and service, but not so much of the latter as to overwhelm the first two. I also leave a School respected in many quarters of this country. The slow accumulation of respect and intellectual stature pays off in recruiting, a severe test. Not only is this true of us but the whole University of Massachusetts has done exceptionally well these past few years. We need apologize to no one. For those who come the atmosphere is exciting and for those who leave we are an excellent spring board to similar and better (give us a few more years yet) universities and colleges. I cannot think of a better place to leave and a better place to have memories about.

SOME FACTS AND FIGURES

1. Appropriations

	1964-1965	1965-1966	1966-1967
03	$11,400*	$21,900	$20,700
10	1,800	3,800	6,000
11	100	100	900
12	600	1,200	2,200
13	2,200*	3,200	7,000
14	3,500*	4,660	9,200
15	500	1,000	3,500
16	600	100	686

*Deficits in these accounts were covered by the Provost.

2. Faculty and Graduate Assistants

	As of September		
	1964	1965	1966
Professors.....	7	8	9
Associate Professors...	8	11	13
Assistant Professors...	13	13	15
Instructors.....	3	5	5
Graduate Assistants....	10	18	25
Lecturer.....	--	--	1
Total faculty(excluding Dean)	31	37	43

Note: These figures include faculty on leave of absence:

Two Professors and One Assistant Professor in 1964;

One Professor and One Assistant Professor in 1965;

Two Professors in 1966.

3. Students

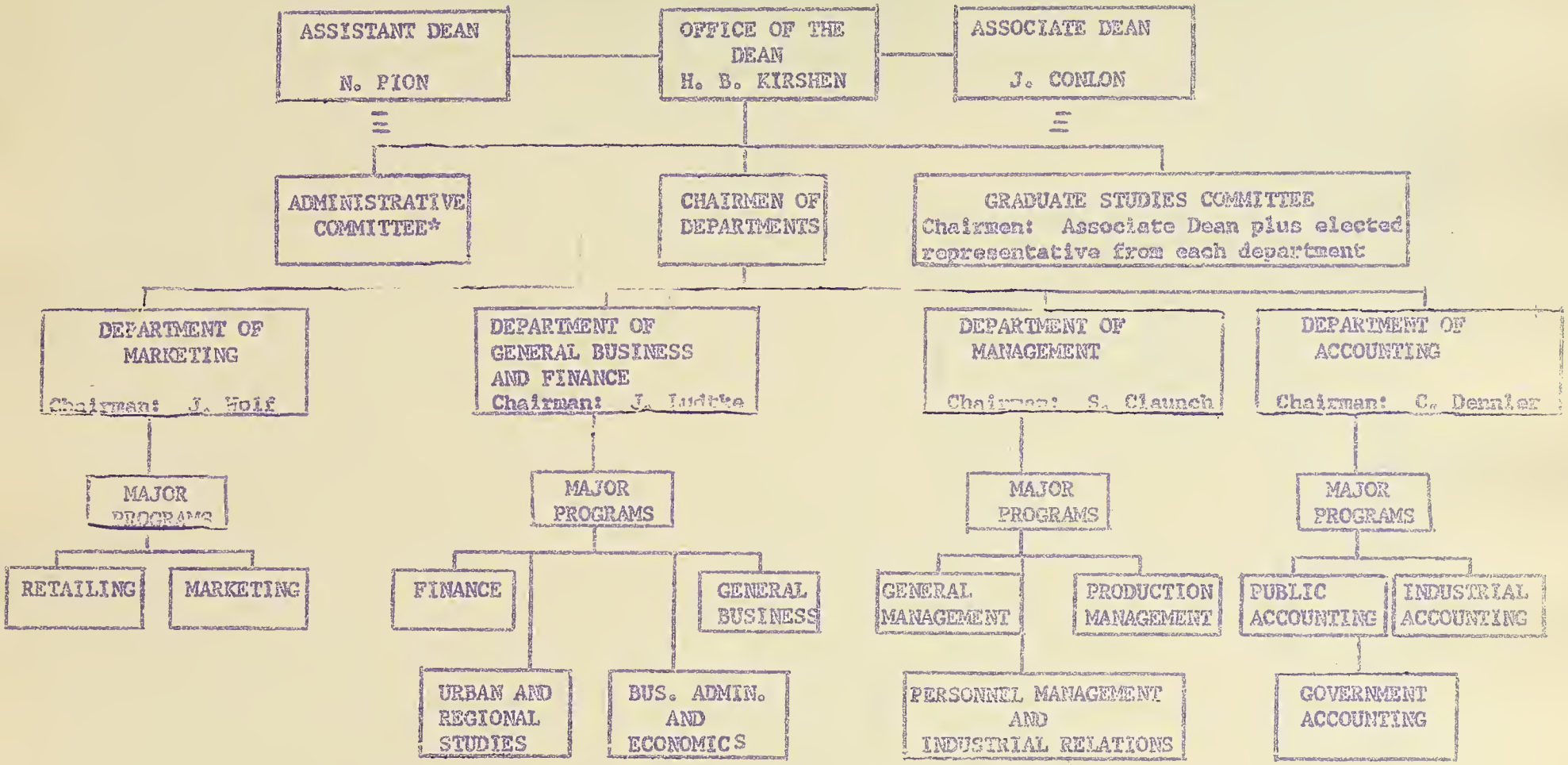
	As of September		
	1964	1965	1966
Accounting.....	114	148	143
General Business and Finance....	57	73	86
Management.....	87	148	124
Marketing.....	56	78	100
Freshmen*.....	144	196	303
Sophomores*.....	248	260	316
Undeclared juniors.....	---	---	71
Graduate students.....	82	103	87
Total on campus.....	788	1,006	1,230
Graduate students at Pittsfield.	42	45	24
Total students taught on campus	1,955	2,500	2,707

*Students select their majors in the second half of their sophomore year. It should be noted that our Sophomore class is almost invariably larger than our Freshman class due to transfers from both inside and outside the University.

Enrollments in Schools of Business Administration levelled off between 1959 and 1964 but are now rising rapidly particularly is this true of our School having increased 56% from 1964 to 1966. As in other fields, graduate enrollments are also rising. We have between 9.5 and 10% of the total University enrollment but if one excludes women our per cent is between thirteen and fourteen of the men. Business Administration draws only between one and two per cent of the women. This is true thoughout the country and this percentage seems true of Economics.

4. Organizational Chart
June, 1967

SCHOOL OF BUSINESS ADMINISTRATION



*Includes the Dean, Associate Dean and Department Chairmen. Beginning July 1, 1966 our Director of the Center for Business and Economic Research became a member of the Administrative Committee.

FACULTY AND DEPARTMENTAL ACTIVITY

Greater detail concerning Grants, Research, and Publications will be found in Appendix A, page 13.

As a statistical summary it is pleasant to report that this past academic year our faculty has listed:

Articles Published.....	25
Articles Accepted...	7
Books Published.....	2
Under Contract.....	10
Scheduled for Publication.....	2

Associate Professor Krzystofik has been named Editor of the Massachusetts C.P.A. Review.

Contrary to the opinion held by many who view Schools of Business Administration I have firmly held the view that our relationships with Business and Industry should be through scholarly and sophisticated members of our faculty and that the Dean should, in all his works, reflect that approach. Giving speeches and attending cocktail parties have their value in goodwill, but they accomplish nothing whatsoever in enhancing the stature and excellence in education. Fourth rate Schools are quite adept at the technique, but they remain fourth or fifth rate Schools nonetheless. When I see the impact of men like Grant Osborn on the Insurance Industry, Morton Backer and Frank Singer on Accounting and Accountants, Harry Allan, Is Silver and Dick Hartzler on Law, Jim Ludtke and Pao Cheng on Banking and Investment officers, Gene Kaczka and Steve Michael on Personnel, and quantitative man, Stanley Young, on research in Management and his influence on managers, Jack Conlon and his direct line to professional Mediators and Arbitrators of labor disputes, then I have no apologies to make of a substantial nature. We are doing what a School should do, but it can do a lot more.

While considering faculty I have a comment to make. There are those who wish we had many more opportunities to earn money through consulting contracts as well as other means. This has advantages, but I hope the School avoids "Odiorne's Law." This law, as I express it, holds that the basic salary is not significant, but the amount earned above the salary really establishes stature and reputation for a School. This "Law" has an analogy in the work of a waitress where her wages are a small part of her income, since tips determine her standard of living. Any School or University that lives according to "Odiorne's Law" corrupts the meaning of education and reduces the basic salary incentive as a means of maintaining a scholarly outlook, not to mention a desire to teach. "Odiorne's Law" grants a member of the faculty a "concession" within the university tent wherein he becomes an entrepreneur rather than a man of scholarship and academic influence. Not only that but he becomes a handmaiden of vested interests, selling his brains down the river. I favor consulting and making money, but I do not favor letting it overwhelm the work of the main enterprise which is the work of a university: teaching, research, and service, with the first two having priority and carrying the most weight. If a university wishes to stress public service, particularly when it is a public university, then it must have the resources to accomplish such a purpose. It cannot allocate scarce resources and accomplish all the goals pressed upon it by a variety of interests. Even its public service should be intimately related to education of a university level. It is not a public university for purposes of entertainment. It is a public university whose primary function is to maintain a high degree of the society's cultural heritage, to be critical of society's foibles, fictions, and beliefs however widely held, and to contribute to an ever increasing level of attainment in the professions, the humanities, the sciences, and social

sciences. It should be the chief center for experimentation and investigation and it should have faculty and administrators who are dedicated, alert, intelligent, and civilized. Whatever we do should be tested by this ideal.

I may say that my own strong feeling is that our School of Business Administration should be tested by its participation in the higher levels of scholarship and teaching. Its future on this campus depends a great deal on whether it will have the support it has received these past few years, not only in funds, but in genuine concern and effective respect and dignity.

I can only emphasize again that the recruitment of an excellent faculty is the same as asking for the support services in secretarial help, in supplies,and in equipment. Previous budgets can no longer be a guide as all of us know. Budgets, of course, depend on the generosity of the General Court and its attitude towards higher education. We understand this basic limitation of wants. On the other hand, equally important to any School or College on the campus is the allocation of what we do have. None of us really know how this is really done. I suspect that some day the Dean's Council will play a much more active part in this than now. It is bound to happen as the University grows.

SPECIAL PROGRAMS

1. This year we have twenty-three JETs (Junior Executive Training), most of them from Western Europe. This program, that we have had for the past eight years, has been sponsored by the Experiment in International Living. We have considered the program very valuable to all concerned. It will continue and for this I am pleased. Professor Harry Allan replaced Professor Robert Lentilhon as Coordinator.

2. Professor Stephen Michael planned our School Colloquium this past academic year and we have had distinguished visitors on the campus:

Fall Semester, 1966

October 6 Dr. Wendell Smith, President, Marketing Science Institute: "Critical Issues in Marketing."

November 3 Dr. Hugh Miser, Vice President, Travelers Research Center: "Operations and Systems Analysis in Government and Industry."

December 8 Dean Willis Winn, Wharton School of Finance and Commerce, University of Pennsylvania, Beta Gamma Sigma Lecture: "The Impact of Economic Change on Education."

Spring Semester, 1967

March 2 Professor James Thompson, Indiana University: "Coping With Technological and Environmental Uncertainties in the Organization."

April 7 Mr. Ralph Nader, author of "Unsafe at Any Speed:" "The Social Responsibilities of Business."

May 4 Professor Colston Warne, Department of Economics, Amherst College and President of Consumers Union: "Marketing Implications of the World Consumer Movement."

3. Associate Dean Conlon, with Associate Director Friedman of the Labor Relations and Research Center, continued their collaboration on a conference for Labor Arbitrators. It was highly successful. Plans have been completed for another such conference next November. These conferences draw a few hundred interested people from all over New England, some from other areas of the United States.

4. Our Ph.D. Program is not really a special one but we treat it as such until it is more thoroughly established. We expect from twelve to fifteen

students this coming September. We have high hopes for our doctorate program realizing that it will take some time before our School earns any kind of a reputation for the granting of a Ph.D. degree. This will come as it comes to other aspects of our work. Our faculty is highly qualified. What we now need is a wider academic market from which to draw good candidates. At the moment we get too many applicants from small Schools and Colleges around the Commonwealth, most of them not qualified.

FUTURE PLANS AND NEEDS

I have already expressed my great concern over removing a second building from the priority list. After all, however, this concern will be that of Dr. Wendell Smith. I assume that any new Dean who discovers that the current expansion of the School is crowding us in offices and classrooms will behave like a Dean and make some noise.

I do not believe it is for me to indicate future plans. I can surmise the direction of this School but a new Dean, along with a faculty, will most certainly change the direction of the School and certainly take account of trends not presently obvious. All this is proper and essential. The School has an excellent academic base from which to move in a number of directions. My own guess is that some of the following might happen:

1. A review of the Departmental organization and structure.

2. A new look at our curriculum and our various majors.

3. A review of our own administrative organization, including the relationship now existing between undergraduate and graduate programs.

4. Probably a review of the place now held by our Administrative Committee (Dean, Associate Dean and Chairmen) as the chief review agency for tenure, promotion, salaries, and other School policies.

These are speculations. Any new Dean will put his own stamp of personality on the School. His relationship with others within and outside the School are more subtle than can be expressed on this Report.

One thing I do hope comes to pass in this University. I think that each Dean should have a contingent fund that is discretionary and useable for a flexible number of purposes. I would say that the fund should be a minimum of $5,000. As the University grows a degree of decentralization should be recognized. These Dean's funds should be post-audited. It is essential that Deans have this element of autonomy to accomplish the goals of their Schools or Colleges. The struggle for University autonomy from State control is too vivid and there is no reason why the restrictions of the State should be imported to the various parts of the University. Centralization for efficiency is not a proved general principle and has as many dangers as the consequences of too high a degree of decentralization. My point is that it is time for a study of the relationship between the central University Administration and its various parts. This not only includes the academic phases but also the services, including the Office of the Treasurer.

Whatever my views on matters expressed I wish to end this final Report as I have begun it. In all my career I have never had as fruitful and wonderful a relationship as I have had with our Provost. Long may his flag fly high in the breeze.

Respectfully submitted,

H B Kirshen

H. B. Kirshen
Dean

HBK:EA

APPENDIX A

GRANTS, RESEARCH, AND FACULTY ACTIVITY

The following represents highlights rather than a complete report on our faculty. All of us, including the Dean, have had a share in making speeches, going to professional meetings and participating on panel discussions. The total impact of all this lies in the atmosphere concerning scholarship, research and service. Some of our faculty are much more active than others, but all are quite conscious of the professional need to keep up-to-date and go beyond and we are also conscious of the fact that knowing our colleagues at professional meetings and participating in discussions have much to do with recruiting the kinds of faculty we wish. We discover, too, how expensive is the competitive race for very good to excellent faculty. Until later the demand exceeds the supply. My own feeling is that every member of the faculty should know enough about his field and about his professional colleagues throughout the country so that he might contribute his bit to naming and recommending faculty in an expanding School.

DEPARTMENT OF ACCOUNTING: Associate Professor Carl Dennler, Chairman

John Anderson and Robert Lentilhon

Both are on Sabbatical Leave the spring semester writing a book on CPA Problems under contract with the Southwestern Publishing Company. Professor Lentilhon was selected by the "Experiment in International Living" last summer to visit Sweden for one month, to live for two weeks with a Swedish couple and spend time surveying Swedish industry. His way was paid except the University contributed $350 towards his expenses.

Morton Backer

One of the country's outstanding Accountants continues to be very active. His book (as Editor) on Modern Accounting Theory (Prentice-Hall) was published in 1966. He published several articles for the Journal of Accounting and Management Accounting and wrote a series for Westinghouse Corporation and

DEPARTMENT OF ACCOUNTING (continued)

wrote for the magazine Financial World. He participated in numerous conferences throughout the country.

Frank Singer

He continues his keen interest in programmed learning in Accounting. In collaboration with Professors K. J. Cohen and T. C. Gilman (Carnegie Tech.) his article "Bank Procedures for Analyzing Business Loan Applications" was published in Analytical Methods in Banking (Irwin and Company, 1966). Frank received a Teachers Research Grant for 1966-1967. His Ford Foundation Fellowship terminated last September, 1966.

Anthony Krzystofik

He was selected Editor of the Massachusetts CPA Review. One of his articles in the Review "Needed, New Rules for Management Reporting" won an award for excellence. He was selected to participate in a methods course at Pennsylvania State University in August.

Robert Taylor

He was recently promoted to an Assistant Professor and received his CPA Certificate from the State of Texas in 1966.

Nelson Pion

He was selected to be Assistant Dean in charge of the School's first two years curriculum and advising program. He replaced Thurlo Johnson who left last August, 1966.

At the moment the Department is reviewing its curriculum. With the addition of three excellent men, all with their doctorates, the revision is likely to be extensive. This does not mean that there are not diverse views on the direction of Accounting. It only means that there is a greater balance among the faculty than previously and the art of persuasion should be more effective and vital.

APPENDIX A (continued)

DEPARTMENT OF GENERAL BUSINESS AND FINANCE, Professor James B. Ludtke, Chairman

PUBLICATIONS

Harry T. Allan

"Executive Development, the Computer, and the Modern Retailer"; Northwest Business Management, Vol. IV, No. 2, pp. 11-14; Winter 1966-67.

"An Empirical Test of Choice and Decision Postulates in the Cyer-March Behavioral Theory of the Firm"; Administrative Science Quarterly, Vol. II, No. 3, pp. 405-413; December, 1966.

"Democracy or the Scientific Method in Law and Policy Making," by Frederick K. Beutel; Administrative Science Quarterly, Vol. II, No. 3, pp. 507-510; December, 1966.

Harry T. Allan and H. Richard Hartzler

"Legal Theories of Roscoe Pound and Karl Llewellyn: Their Application to the Study of Behavior Within Business Organizations"; Vol. 5, No. 1, pp. 1-24; Spring 1967, American Business Law Journal.

Alexander Barges

"Business Finance: Theory and Management," by Stephen H. Archer and Charles A. D'Ambrosio; The Journal of Finance, Vol. XXI, No. 4, pp. 762-764; December, 1966.

Pao L. Cheng and John P. Shelton

"A Contribution to the Theory of Capital Budgeting--The Multi-Investment Case," Appears as one of the readings in Thomas H. Williams and Charles H. Griffin, editors, Management Information--A Quantitative Accent, Homewood, Illinois: R. D. Irwin, Inc., 1967. (Article first appeared in Journal of Finance, December, 1963).

Pao L. Cheng

"Optimum Bond Portfolio Selection," Appears in K. J. Cohen and F. S. Hammer, Analytical Methods in Banking, Homewood, Illinois: R. D. Irwin, Inc., 1966. (Article frst appeared in Management Science, July 1962).

H. Richard Hartzler and Harry T. Allan

"Legal Theories of Roscoe Pound and Karl Llewellyn: Their Application to the Study of Behavior Within Business Organizations"; Vol. 5, No. 1, pp. 1-24; Spring 1967, American Business Law Journal.

DEPARTMENT OF GENERAL BUSINESS AND FINANCE (continued)

PUBLICATIONS, (continued)

James B. Ludtke

"The American Financial System," Second Edition, Allyn and Bacon, 1967; 551 pages.

Robert L. Rivers

"Moving Household Goods: Customer-Carrier Relations;" The Quarterly Review of Economics & Business, Vol. 6, No. 4, Winter 1966.

Isidore Silver

"The Corporate Ombudsman," Harvard Business Review, Vol. 45, No. 3, May-June 1967, pp. 77-87.

"Reforming the Local Policemen," The New Leader, April 24, 1967, pp. 22-24.

"Crime, American Style: The President's Commission," Commonweal, Vol. LXXXVI, No. 5, April 21, 1967, pp. 141-142.

"The CIA as Philantropist," Congress Bi-Weekly, Vol. 34, No. 5, March 6, 1967, pp. 6-7.

"The Supreme Court, The State Judiciary and State Criminal Procedure: An Example of Uncreative Federalism," St. John's Law Review, Vol. XLI, No. 3, pp. 331-361.

"The Great Society," Congress Bi-Weekly, Vol. 34, No. 2, January 23, 1967, pp. 5-6.

"The Free Press Crisis," Congress Bi-Weekly, Vol. 34, No. 1, January 9, 1967, pp. 6-7.

"Poverty as a Crime," Commonweal, Vol. 84, pp. 74-76, October 21, 1966.

PAPERS PRESENTED

Harry T. Allan

"Anti-Trust Influences on Corporate Expansion," Management Development Program, Corning Glass Company and the University of Syracuse, January, 1967.

"Legal Theories of Roscoe Pound and Karl Llewellyn: Their Application to the Study of Behavior Within Business Organizations," American Business Law Association, Bowling Green, Ohio, August, 1966. (Co-author, H. Richard Hartzler.

DEPARTMENT OF GENERAL BUSINESS AND FINANCE (continued)

PAPERS PRESENTED. (continued)

H. Richard Hartzler

"Legal Theories of Roscoe Pound and Karl Llewellyn: Their Application to the Study of Behavior Within Business Organizations," American Business Law Association, Bowling Green, Ohio, August, 1966. (Co-author, Harry T. Allan)

Eugene E. Kaczka

"Simulation and Gaming," Annual American Meeting of the Institute of Management Science, Boston, Mass., April, 1967.

Grant Osborn

"Professional Development in Life Insurance," Providence Association of Life Underwriters, Providence, Rhode Island, November, 1966.

"Risk Management of Business," Educational Seminar, Insurance Information Institute, Hartford, Connecticut, August, 1967.

"New approaches in Adult Education," CLU Teachers' Conference, Hartford, Connecticut, October, 1966.

"Responsibilities of Professional Life Underwriters," New Haven Society of CLU, New Haven, Connecticut, January, 1967.

"Developments in Life Insurance," Waterbury Association of Life Underwriters, Waterbury, Connecticut, March, 1967.

"The Variable Annuity," Pioneer Valley Estate Planning Council, South Deerfield, Massachusetts, November, 1967.

Robert L. Rivers

"Transportation Requirements and New England Development," New England Industrial Traffic League Seminar, Amherst, Massachusetts, October, 1966.

"Traffic Management in Transition," Boston Traffic Club, Boston, Massachusetts.

ARTICLES ACCEPTED FOR PUBLICATION

Harry T. Allan

"A Programmed Introduction to the Study of Law," by Charles D. Kelso. American Business Law Journal. (Scheduled for inclusion in the Fall 1967 issue.)

Pao L. Cheng

"Wage Negotiation and the Bargaining Power," Industrial and Labor Relations Review. (Scheduled in late 1967.)

DEPARTMENT OF GENERAL BUSINESS AND FINANCE (continued)

ARTICLES ACCEPTED FOR PUBLICATION (continued)

H. Richard Hartzler

"Functions of Contract Damages," American Business Law Journal, (Scheduled for inclusion in the Fall 1967 issue).

Eugene E. Kaczka and Roy V. Kirk

"Management Climate, Work Groups, and Organizational Performance," Administrative Science Quarterly. (Scheduled for inclusion in either the September or December, 1967 issue.)

Grant Osborn

"Future Supply of Health Manpower," Scheduled for inclusion in Richard Campau's, editor, Health Economics. (To be published in the Fall, 1967.)

APPENDIX A (continued)

DEPARTMENT OF MANAGEMENT: Associate Professor Sidney Claunch, Chairman to be replaced by Associate Professor George Simmons as Acting Chairman, July, 1967.

Arthur Carlisle

His revised thesis on Labor Relations in Canada is scheduled for publication by the University of Michigan in 1967.

Gordon Chen

Submitted a research project to the Department of Health, Education and Welfare on a "Feasibility Study of Cost-Benefit Analysis of the AFDC Program in Massachusetts." Dr. Chen contributed to Production Management Analysis: A Case Book by Garrett, Silver and Yost (Harcourt, Brace and World, Inc., 1966). With Professor Winters he collaborated on "Forecasting Peak Demand for an Electric Utility with Hybrid Exponential Model" published in Management Science, 1966. Received Research Grant from the University to study Computer Models for Operations Analysis. Attended a number of professional meetings.

Arthur Elkins

Received his D.B.A. degree from Indiana University in the spring, 1967. He was a participant in the Organizational Workshop at the University of Chicago Graduate School of Business in 1967.

Frederick Finch and Halsey Jones

Received research grants for the summer, 1967.

Stephan Michael

Received his Ph.D. from Columbia University, April, 1967. His book Appraising Management Practices and Performance, 1963 was the 1967 selection of the Management Books Institute, a reading club. He signed a contract and received an advance of $2500 from the International Textbook Company to write a Principles of Management book.

Walter O'Donnell

Visiting Professor of Management at the University of New Mexico during the past academic year. He was re-elected to the Executive Committee of the College of Philosophy of the Institute of Management Science.

APPENDIX A (continued)

DEPARTMENT OF MANAGEMENT (continued)

Stanley Young

His article "Communications" was published in the AORN Journal (Association of Operating Room Nurses), 1967. He was reappointed Chairman of the Research Committee of the Academy of Management for 1967. He entered a contract with the Dickenson Publishing Company to write a book on Management.

APPENDIX A (continued)

DEPARTMENT OF MARKETING: Professor Jack Wolf, Chairman

The undergraduate curriculum was thoroughly and completely revised under the leadership of Professor Wolf in cooperation with the Department. In addition a number of very good men were added to the faculty, some of whom will be here in the fall, 1967. The Behavioral Science Laboratory, soon under construction, was "sparked" by one of the new men and gradually gathered strength in the School.

Jack Wolf

Invited to a number of important conferences and was a Conference Leader of a Management Development Seminar of the National Beer Wholesalers Association.

Robert Drew-Bear

Has completed a 500 page book now in press on the Mass Merchandising Revolution. This is the result of three years of study and research. He acts as a Consultant to the Zayre Corporation. He is currently editing the Proceedings of the Mass Merchandising Research Conference held last April, 1967.

John Robert Gunnigle

In collaboration with Mary Kelly Black, staff member of the Journal of Marketing Research, published "Is JMR a Success", February, 1967.

Harold Hardy

Formerly Chairman of the Department is on Sabbatical leave.

Lawrence Johnson

Active in recruiting qualified negro students for the University of Massachusetts. He is completing his Ph.D. degree at Stanford University and plans to be there in the summer, 1967.

George Schwartz

Delivered a paper on "Creativity and Marketing" at the American Marketing Association in September, 1966. This is in the Proceedings of the meeting. He reviewed a book in the Saturday Review, September 10, 1966. He was invited to participate in the National Marketing Theory Seminar at the University of Vermont last August. He was also a member of the Marketing Abstracts Staff of the Journal of Marketing.

APPENDIX B

Business Advisory Council

Mr. Charles A. Campbell.....	Vice-President, I.B.M. World Trade Corporation 821 United Nations Plaza, New York 17, New York
Mr. Harold Elder.....	Owner, Mutual Plumbing and Heating Company 63 South Pleasant Street, Amherst, Massachusetts
Dr. George Ellis.....	President, Federal Reserve Bank of Boston 30 Pearl Street, Boston, Massachusetts
Mr. Fred Emerson.....	University of Massachusetts Trustee Vice-President, Spartan Saw Works Inc. 152 Fisk Avenue, Springfield 7, Massachusetts
Mr. Robert Harper.....	Vice-President and General Manager Greenfield Tap and Die, Greenfield, Massachusetts
Mr. Abe Marks.....	President of Hartfield Stores, New York City Chairman, Board of Trustees: Mass Merchandising Research Foundation
Mr. Roger Putnam.....	Chairman of the Board, Package Machinery Corporation East Longmeadow, Massachusetts 01028
Dr. Leonard Silk.....	Economist and Vice Chairman, Editorial Board BUSINESS WEEK 330 West 42nd Street, New York, New York
Mr. Philip Singleton.....	President, Pro-phy-lac-tic Brush Company Florence, Massachusetts
Mr. Herman Stuetzer, Jr.....	Partner, Lybrand Ross Brothers and Montgomery 80 Federal Street, Boston 10, Massachusetts

June 15, 1967

President John Lederle:

Sir, I beg leave herewith to present my eleventh and last annual report of the School of Education.

As the date of my retirement draws near, I find myself comparing the present School of Education and its sound programs and good staff and facilities with the two offices and one classroom which I found when I arrived in Stockbridge Hall on that cold wintry morning in February over thirty-one years ago. As I hand over the reins to another Dean I view with gratification the progress that we have been able to achieve, just as I view with regret the things which because of inadequate resources we were not able to accomplish. The course has been long and at times the path has been rough and steep, but always the view ahead has been interesting and challenging.

So I prepare to leave my position as Professor and Dean with nothing but good wishes for the future of the University and its School of Education.

Albert W. Purvis

awp:lph

In Retrospect

As one prepares to retire after thirty-one years, the temptation is great to look back over those years and to note the progress that has been made by comparing what we had to start with and what we have now. Certainly, from this point of view the progress has been most gratifying. From very little in terms of facilities we have our present modern School of Education Building. From practically nothing in terms of equipment we have become one of the best equipped Schools of Education on the eastern seaboard. From two faculty positions in Education we have increased to thirty-eight. From no supporting staff at all we have increased our secretaries to eleven and our technical staff to seven. From no observation facilities we have developed our outstanding Mark's Meadow School. From practically no Education books we have developed one of the best branch libraries on campus with close to twenty thousand volumes. From a very inadequate undergraduate program we have developed one of high quality in terms of the type of students we enlist and in terms of the education they receive. From a very meager beginning in graduate work we have come to a program which ranks second only to Arts and Sciences in enrollment and second to very few in quality.

Yes, we have come a long way, often against many road blocks and frequently despite the raucous cries of our detractors.

In this progress various points of special interest might be cited as follows:

(1) We were almost alone twenty years ago in our insistence that our teacher trainees should have a large proportion of their undergraduate work in Arts and Sciences. Even today, very few elementary education programs require ninety hours in Arts and Sciences, or eighteen hours in science and mathematics, or a minor in Arts and Sciences, or intermediate proficiency in a foreign language. Even today, very few secondary education programs insist that the student must major in his teaching field and that no more than eighteen hours can be in Education. For years we were considered reactionary for this point of view but lately we have become more fashionable because of it.

(2) We were among the first in the multi-purpose institutions to introduce the Block system of Student Teaching which permits eight full weeks of uninterrupted practice. It is true that this constricts our methods courses into short periods but we feel that this disadvantage is far outweighed by the obvious advantage of the increased practice. This would appear to explain why many other institutions have since adopted such a schedule.

(3) We have developed one of the best Laboratory Schools in the country. It has unexcelled observation possibilities from the upstairs corridor from which through one-way glass thirteen elementary school classrooms are one hundred percent visible. By means of this facility our elementary education students obtain one of the finest programs of observation to be found anywhere. Next fall we will have available many of these same observation values for secondary education students through the closed-circuit television tie-in with the Amherst Regional High School and through the mobile television tape recording equipment now being planned. These media also can be claimed to be outstanding.

(4) We have made much more use of closed-circuit television and television tape recording than most schools not only in the student observation mentioned above but also in instruction, in simulated situations, in group therapy, and in aiding students to appraise their teaching.

(5) We have developed three graduate programs leading to the Doctor of Education, the only ones in public institutions in the state. Two of these, Educational Administration and Educational Guidance, are off to a very good beginning with sound programs and many good students. The third, Curriculum and Instruction, is making a very good start. This latter program requires more Arts and Sciences than practically any other Doctor of Education degree in the country and thus carries our broad education idea into graduate work.

(6) Through several funded projects the School has extended its efforts in various directions. The Uganda project has extended our interests and influence to foreign lands; the Kellogg project has extended our in-

terests and influence to the state community colleges; the four-college project has brought us closer to the other colleges in the valley; the several institutes have provided much inservice training for teachers; the Kettering project has extended our horizons in research; the Distributive Education grant has carried our considerations into an area almost unknown in New England and in which we have been chosen to serve as the regional center; and several grants have doubled the amount available for Graduate Fellows. We believe that our accomplishments in this area have been rather remarkable for a School of this size and one that is only eleven years old.

It must not be thought that this progress was distributed evenly over the thirty-one years. For twenty of those years we were a department in the Division of Social Science and progress was very slow and very disheartening. This was not entirely to be blamed on the Deans in that division nor those who came later in the College of Arts and Sciences. On the contrary we have always been quite fortunate in that regard and abundant cooperation has not been wanting. But we were, as a professional area, no more than a step-child in their family, especially since there were indications in the speeches of the presidents for years that we were soon to become a School in our own right. This, with all the interruptions of World War II, the Korean War and the influx of the returning veterans held us back until 1956 when the School of Education was organized. During the next five years growth was slow but steady and support kept pace. Our time was devoted largely to planning our new School of Education Building which we entered in the summer of 1961.

The last five or six years can be divided into two almost equal divisions so far as the history of the School is concerned. The first three years of the period brought rather spectacular growth and very good support. These were undoubtedly the most encouraging and the most exhilerating years of my tenure at the University, so much so that in my Annual Report in the

spring of 1964 I wrote the following:

"The School has now completed its eighth year and again I must report a 'big year.' We have been in our new quarters for three years but already we are planning a large addition. Our undergraduate enrollment continues to grow rather rapidly but our graduate enrollment is increasing spectacularly. We have been accredited through the Masters degree and our new doctorate is progressing very favorably. There has been increased interest and activity in research and consultation on the part of the staff and our newly organized School Service Council shows much promise.

I believe we have now built up a momentum which if continued will soon make our School an important instrument in upgrading the educational system of the Commonwealth.

In all of this there is a sense of urgency (and exhileration). We are under pressure to grow in a very few years to the stature other high prestige Schools of Education had thirty years to achieve. Can we be satisfied with anything less?

This momentum could only have been built up through the cooperation and support of the administration. For this we are very grateful. We wish to assure the administration in turn of our continued loyalty and support."

And indeed our high hopes seemed to be justified as is shown in these tables:

ENROLLMENT**

Year	First Semester			Second Semester			Total		
	U	G	T	U	G	T	U	G	T
1960-61*	553	197	750	598	203	801	1151	400	1551
1961-62	748	239	987	741	223	964	1489	462	1951
1962-63	866	277	1143	814	323	1137	1680	600	2280
1963-64	903	402	1305	890	459	1349	1793	861	2654
Increase as a percentage of 1960-61							56%	115%	71%

ELEMENTARY MAJORS

1960-61*	397 majors
1961-62	426 majors
1962-63	448 majors
1963-64	485 majors
Increase as a percentage of 1960-61	22%

FACULTY POSITIONS

September '61*	19 positions
September '62	23 positions
September '63	28 positions
September '64	34 positions
Increase as a percentage of 1960-61	79%

* Base year
** See complete table in Appendix

It is to be noted:

(1) The undergraduate enrollment had increased from 1151 to 1793 or an increase of 56%.

(2) The graduate enrollment had increased from 400 to 861 or an increase of 115%.

(3) The total enrollment had increased from 1551 to 2654 or an increase of 71%.

(4) Our elementary education majors had increased from 397 to 485 or an increase of 22%.

The support during the three years had been very good. It had increased at a rate roughly equal to the increased enrollment. The budget, in what might be called the operational categories, had increased from $39,100 to $68,730 or an increase of 76%. The Faculty had increased from 19 to 34 or an increase of 79%. The tables showed a rather remarkable consistency between growth and support with growth indicated by 71% and support indicated by 76% and 79% respectively. The small difference between growth and support in these three years, in favor of support, is an indication of, and justified by, the much greater relative increase in the graduate program. It is to be noted also that the growth and support indexes for the three years are approximately 24% for each year.

There were other developments which indicated bright promise in that spring of 1964. Some of these were:

(1) We had just started two doctoral programs and already the interest and enrollment was very encouraging.

(2) We had just started our Cooperative School Service Council and the interest and participation of school systems was very good.

(3) We were getting more and more requests to provide services and we were able to meet more and more of them.

(4) The Faculty were getting more and more interested in various funded projects and the Tororo Girls School was by now an actuality.

(5) All our programs, undergraduate and Masters Degree, had just been accredited by the National Council For Accreditation of Teacher Education and the Visiting Team had expressed itself as quite impressed with the quality of our students, faculty and programs.

(6) Our Capital Outlay looked very encouraging indeed. We had just been allocated $200,000 for electronic equipment and our request for planning money for an addition to our present building had been given good priority on the University Capital Outlay Requests that had been sent to Boston.

(7) The President had just given us the go-ahead in a project which he had in mind and which we had been discussing for two or three years--the development of a really innovative and efficient Learning Resources

Center in the School of Education. This was a very comprehensive idea. The center would include our branch library, a curriculum library, the audiovisual center, programmed learning, computerized learning, radio and television. This would be given adequate space in the addition to our new building and would not only house all these learning resources but would house personnel to do research in using these media in learning.

(8) The only fly in the ointment was that the support for our graduate program in terms of graduate assistants and fellows had been extremely meager in terms of our rapidly growing graduate programs and enrollment and our new ventures into the doctorate. However, the Dean of the Graduate School had just come up with a new formula which would have given the School of Education $60,000 for these purposes in 1965 and increased amounts thereafter and we thought that this, with additional amounts from the School 03 account and from federal and other funds, would put us in an excellent position to attract top-notch graduate students.

In Summary. There was every reason for the very optimistic picture drawn in my Annual Report of 1964. We were getting increasingly better support in budget, in faculty, and in facilities; our hopes were high, faculty morale was excellent, and we were getting fine cooperation from other Schools on campus.

In that spring of 1964 we made several estimates and predictions and the faculty were asked to plan the future of the School on the basis of these predictions. It seemed reasonable to assume that the enrollment would continue to increase each year with an index of 24% or slightly lower just as it had during the previous three years (see page 27) and it was just as reasonable, we thought, that support would continue to increase at approximately the same rate. Consequently we began to plan for new programs in business education, in special education, and in distributive education. We began to plan for new and larger conferences, colloquia, and in-service seminars and workshops. We decided to enlarge our student

teaching area to include western Massachusetts and the Worcester area. Our Learning Resources Center would be implemented and the addition to our building would be planned with all of the above in mind.

A truly exciting spring.

As it turned out, our predictions of growth were not far off as is shown by the following tables:

ENROLLMENT

Year	First Semester			Second Semester					
	U	G	T	U	G	T	U	G	T
1963-64*	903	402	1305	890	459	1349	1793	861	2654
1964-65	1023	666	1689	1035	665	1700	2058	1331	3389
1965-66	1062	776	1838	1066	951	2017	2128	1727	3855
1966-67	1286	791	2077	1449	942	2391	2735	1733	4468
*Base year									
Increase as a percentage of 1963-64							53%	101%	69%

ELEMENTARY MAJORS

1963-64*	485 majors
1964-65	607 majors
1965-66	695 majors
1966-67	837 majors
Increase as a percentage of 1963-64	73%

It is to be noted that:

(1) In the last three years undergraduate enrollment in the School increased from 1793 to 2735 or an increase of 53%.

(2) In the last three years graduate enrollment increased from 861 to 1733 or an increase of 101%.

(3) In the past three years total enrollment increased from 2654 to 4468 or an increase of 69%.

(4) In the past three years the number of elementary education majors increased from 485 to 837 or an increase of 73%.

From the above, taking only total enrollment as the basis, the index of growth for each of the last three years would be 23%. If we include the large increase in majors the index would approximate very closely the 24% index of the first three years being considered.

With an index of growth in enrollment of 23% each year it seems reasonable to assume that the index of support would be much the same, particularly since new programs were planned and the growth again was relatively larger in the graduate area.

However, since support cannot always exactly match growth it seems reasonable to assume an index of support of 20% each year should have been forthcoming. Based on this index our support would have resembled the following:

BUDGET (03,10,11,12,13,14,15)

	Actual	Predicted	% Under Prediction	% Under 1964-65
1964-65	68730			
1965-66	56050	82500	-32	-18
1966-67	59700	99000	-40	-13
1967-68*				

*Not in yet
Increase as a percentage of 1964-65 - 13%

FACULTY POSITIONS

	Actual	Predicted
September 1964	34 positions	(20%)
September 1965	36 positions	40
September 1966	39 positions	48
September 1967	38 positions	57

Actual increase as a percentage of 1964 12%

We have checked and rechecked these tables and we believe them to be substantially correct. They reveal that the index of growth in budget for each of the two years averaged minus 15% and the index of growth in faculty positions for the three years averaged 4% each year.

In Summary. The growth index for each year was 23% while the support index for budget was -15% and for faculty positions 4% each year.

If the support index for budget had approximated the 23% index for growth (we used 20%) the School last year would have had $82,500 instead of the $56,050 actually received and this year it would have received $99,000 instead of the $59,700 actually received.

If the support index for faculty positions had approximated the growth index of 23% (we used 20%) the School this coming fall would have 57 positions rather than 38.

It might even be argued that the support index should not be expected to keep up with the growth index because for a time growth in enrollment can be absorbed by larger classes. While this is a dubious assumption on a long-range basis and particularly when much of the growth is in graduate enrollment which is very profligate of budget and faculty, still one might be persuaded to accept a lower support index. What would be the picture if, instead of the 20% index which was used, we use a 15% support index. With a growth index of 23% it is difficult to see how a School could go any below a 15% support index without rather serious consequences.

If we accept the 15% support index as a minimum our budget this year would have been $91,000 instead of the $59,700 actually received.

If we accept the 15% support index as a minimum our faculty positions for September, 1967 would number 52 instead of the 38 presently in hand.

The inevitable conclusion of course is that for a period of time of two years in budget and three years in new faculty the School has not had,

to use a gross understatement, adequate support.

This is borne out by additional evidence that our optimism and exhileration of 1964 was unfounded. Consider these:

(1) The request for planning money for the addition to the present building occupied a very favorable place on the University Capital Outlay Requests for 1964. It isn't even on the present list.

(2) The Learning Resources Center never did get off the ground; the Audiovisual Center has been very poorly supported; and the original plan to have radio and educational television as part of the complex now seems to have been scrapped.

(3) The proposed new formula of the Dean of the Graduate School which would have given the School of Education much more adequate support for its graduate program never was put into effect and consequently we are struggling along with by far the lowest support per student of any School on campus. (See latest report of the Graduate School from which I have taken the following statement).

> ".... this provided a total of $2,314,662 available for use in support of 1822 degree students in the Graduate School during 1965-66, or an <u>average of $1270</u> per student. A realistic optimum for a quality graduate program in the present market would call for an average of $2000 per student."

The School of Education with the second largest graduate enrollment of all the colleges and schools and with an ever increasing enrollment and new programs was supported to the extent of <u>$149</u> per student. This gave us $52,000 for Graduate Assistants, almost half of which the faculty of the School obtained for itself in funded projects. The next highest school received more than twice as much support per student. The only conclusion would appear to be that our graduate program is still not being supported at all adequately.

(4) Many of the plans made in 1964 for conferences, colloquia, and in-service seminars have had to be shelved for lack of funds and positions to support them.

(5) Two major programs we had hoped to begin in 1965 have been postponed or shelved. Special Education should have been initiated years ago. We hoped to get started in a minor way last year with one position. We do not have that one position now. Distributive Education should have started two years ago. We did not have the positions and budget to do so and consequently we had to rely on federal projects to get under way. It looks now as though funds will be made available this fall and this will enable the School to get the Distributive Education program going by September, 1968 just three years late.

In Summary. In three years our enrollment has increased 69% but our faculty has increased only 12% and our budget in the operational categories has actually decreased by 13%.

This lack of adequate support for the School during the past two years has had a very serious effect on the momentum which was, three years ago, carrying the School forward at a very encouraging rate. Even with a sudden and very dramatic increase in support it is probable that it will take several years at least to overcome the loss of momentum the School has sustained.

REPORTS ON SPECIAL PROJECTS

Mark's Meadow School

Below are some excerpts from the annual report of the Principal of the Laboratory School. These are included so that the reader can obtain some idea of the extent of the activities and the manner in which the Laboratory School and the School of Education coordinate their efforts.

A. Undergraduate Teacher Training

1. Freshman, Sophomore Observation.

The Laboratory School played a central role in Education 009 and 039 Student Observation. Closed circuit television, video tape recordings, and the observation corridor were all used to provide observation of good lessons for four hundred and eighty (480) students. In order to strengthen this program even more it is recommended that (a) we purchase sufficient video tape so that a library of top notch lessons can be developed, and (b) we broaden the scope of the observation experience by bringing in consultants and speakers in such fields as guidance, administration and professional associations, and (c) we involve even more the faculty of the Laboratory School by utilizing them to speak to the students before and after observation sessions, and (d) we request the Elementary Education faculty of the School of Education to become more involved in planning the observation sequence and the things to be observed.

2. Junior Observation and Aiding.

The juniors spend fifteen hours each working with one of the teachers in the Laboratory School as part of Education 059 Student Observation. This is a strong program and should be further developed since it serves as the initial classroom contact of the prospective teacher. This year two hundred ten (210) juniors took part in this activity. There is reason to suggest that some of this should be done in the sophomore year.

3. Senior Student Teaching.

At the present time the Laboratory School does not accept student teachers. This decision is based on the assumption

that the involvement of student teachers would decrease the value of the observation now available. It is suggested that a small number of student teachers might be placed here to work in innovative programs which in themselves should be available for observation.

B. Graduate Programs.

The chief involvement of the Laboratory School in graduate programs lies in providing children (1) for records of growth, development of concepts, etc. and (2) for corridor observation of special programs and (3) for making video tapes for case studies and (4) for observation and study of special students. One interesting project was a seminar for sixth grade students to orient them to problems of beginning Junior High School next year. This was organized and run by a faculty member in the School of Education and four of his graduate students.

C. Curriculum.

The Laboratory School is part of the Amherst School System and, in general, follows the Amherst curriculum. In addition it is a school devoted to research and the implementation of new programs. The following are some of the areas which have been studied and implemented in the Laboratory School in late years:

1. Ungraded primary and intermediate reading programs
2. Linguistics in Grade 3
3. Individualized spelling, Grades 4, 5, 6
4. Programmed spelling, Grades 2, 3
5. Cooperative grouping in mathematics, Grades 1, 2, 3, 6
6. Cleveland Social Science Program, Grades 1-6

D. Visitors.

We continue to serve as a source of observation and curriculum leadership for surrounding communities as more and more visiting teachers continue to request permission to spend time in the observation corridor. In addition, the Future Teachers Program continues to attract visiting high school students who are interested in training to be teachers. This year we decided not to send invitations, as had been done previously, but despite this lack of invitation we hosted twelve high school clubs including over two hundred and fifty high school students. Next year we plan to return to the invitation procedure and to send the invitations to all parts of the state.

The School of Education and the Laboratory School are to be commended for the fine spirit of friendly cooperation which exists between them and for their fine relationship with the Amherst School System.

The Uganda Project

The following report by Mr. Elwyn Doubleday, the Campus Coordinator of the Uganda Project, is included to describe the size and the increasing complexity of the operation. From time to time there comes from Uganda an intimation that the University is not "totally involved" in the Tororo Girls School. This seems to spring from the fact that although the contract permits us to send over to Uganda various consultants and experts to help with problems of curriculum, administration, and teaching very few have been sent. The reason is simple; none have been requested despite the fact that both Mr. Doubleday and myself have repeatedly stated we will send them consultants on any problem listed by them. The alternative would be for us to decide where help is needed and wanted and that would appear to be unacceptable. From the positive point of view, and from the point of view of any Ugandan so far consulted, the Tororo Girls School is outstanding. We get good students and we provide them with very good teachers, buildings and equipment.

The Uganda Project

During the past year many changes have taken place but the project has continued to grow along the lines planned in 1961 - 1963. Six members of the original staff and two short term replacements returned to the United States after completing their assignments. Five of them have returned to school for advanced degree work and three are continuing in programs dealing with Africa or African education.

The new contract established a total of twelve positions for 1966-1967. Many applications were received for these positions and the Campus Coordinator spent a great deal of his time in screening, travelling and interviewing candidates. The problem of gaining acceptance rapidly once a candidate is selected still takes so much time that good teachers are sometimes lost. However, by January, 1967, all positions under the contract had been filled with well qualified candidates and the following staff members were stationed in Tororo:

One Headmistress
One Business Manager
One Guidance Counselor
One Librarian
Two English Teachers
Two Business Teachers
Three Mathematics-Science Teachers
One Home Economics Teacher

In addition the Uganda Ministry of Education was providing five Ugandan teachers and five American Peace Corps teachers which enabled the Headmistress to schedule the comprehensive program which is being developed.

The addition of the Business Manager in January should make it possible for the Headmistress to devote more of her time to the actual running of the school - to curriculum development and to guidance, two important areas of concern.

Contract negotiations for two new positions have been carried on for several months. They have now been approved bringing the total staff contribution for which the University is responsible in 1967 - 1968 to fourteen. The new positions are one Home Economics teacher and one Mathematics-Science teacher.

In April the Headmistress announced that she did not wish to continue and attempts are being made to find a highly qualified replacement. The need to know the staff requirements at least a year ahead of the actual contract beginning date becomes more and more important as the contract continues. It is impossible to recruit the type of teachers needed to carry on this project without long range planning.

In January, 1967 110 new Senior 1 (Grade 9) girls were accepted and in February, 22 new Senior V (Grade 13) girls enrolled bringing the total number of girls at Tororo to 325. Plans have already been completed to increase this number to over 500 in January, 1968, with the start of Senior IV (Grade 12) and Senior VI (Grade 14). This will make Tororo Girls School one of the largest girls schools in Uganda. It is also interesting to note that the Uganda Government has requested USAID to consider adding laboratories and housing in order to double the size of the higher school Senior V and VI (Grades 13 - 14) and to bring the total enrollment to nearly 700 girls.

If one reflects on the purposes and original plans for Tororo, one finds that this was to be a government girls school for Ugandans from all over the country regardless of race, religion or tribal affiliation. A study of the enrollment indicates that this plan has been effectively implemented. About 93% are Ugandan Africans and 7% Ugandan Asians. About 68% of the girls

come from the Eastern Region but 18% come from the Northern Region, 12% from the Central Region and 1% from the Western Region. The necessity to travel 300 - 400 miles seems to be the major reason for the lack of enrollment from the Western Region.. As for the religious affiliation about 65% are Church of Uganda, 28% Roman Catholic and 7% Muslim or Hindu. These figures should indicate the success in making it a real government school.

1967 also saw the first streaming of the girls in East Africa into an academic group, a business group and a home economics group. Although all girls will sit for five common examinations in academic subjects, the program of instruction offered at Tororo will give many students an opportunity to take examinations either in business subjects or in the home economics area. We fully expect many girls to take positions throughout the country as a result of the comprehensive program being offered.

Only two participants are in training, both at the University of Massachusetts - one as an undergraduate and one as a graduate student. This phase of the program must be given closer attention if well trained Ugandan teachers are to be available to take over the school. Considerable amount of work is now being carried on in an attempt to find suitable candidates for advanced training in order to implement this part of the project.

In 1965, a film entitled A New Girl at Tororo was made by USIA. In October, 1966, Ambassador Stebbins and his wife were hosts to a premiere showing of the film at Tororo for many government officials, staff and students. The film depicts the part Tororo Girls School is playing in developing a comprehensive program of secondary education for girls in a new government school and will be shown all over the world.

In closing I would like to point out that a high level of interest in Tororo Girls School and its programs continues on the part of Ugandans from all walks of life as is witnessed by the number of visitors ranging from school children to educators and high Government officials.

The major problem areas concerning Tororo seem to be: housing for single staff; faulty roof construction which is causing deterioration to the buildings, inadequate notice on staff needs, difficulties on the part of the Ugandan Ministry in obtaining trained staff and even greater difficulties in finding participants for training - both being critical in the final phasing of the project.

Nonetheless, we feel that Tororo Girls School is providing the training for Ugandan girls to make it possible for them to make a real contribution to their country.

Audiovisual Center

Dr. Raymond Wyman, Director of the Audiovisual Center has submitted the following report:

Two years ago at our budget hearing it seemed desirable to all present that we move rather quickly from our limited audiovisual center toward a comprehensive learning resources center to support the faculty and students of the entire University. A diagram of the proposed center is attached.

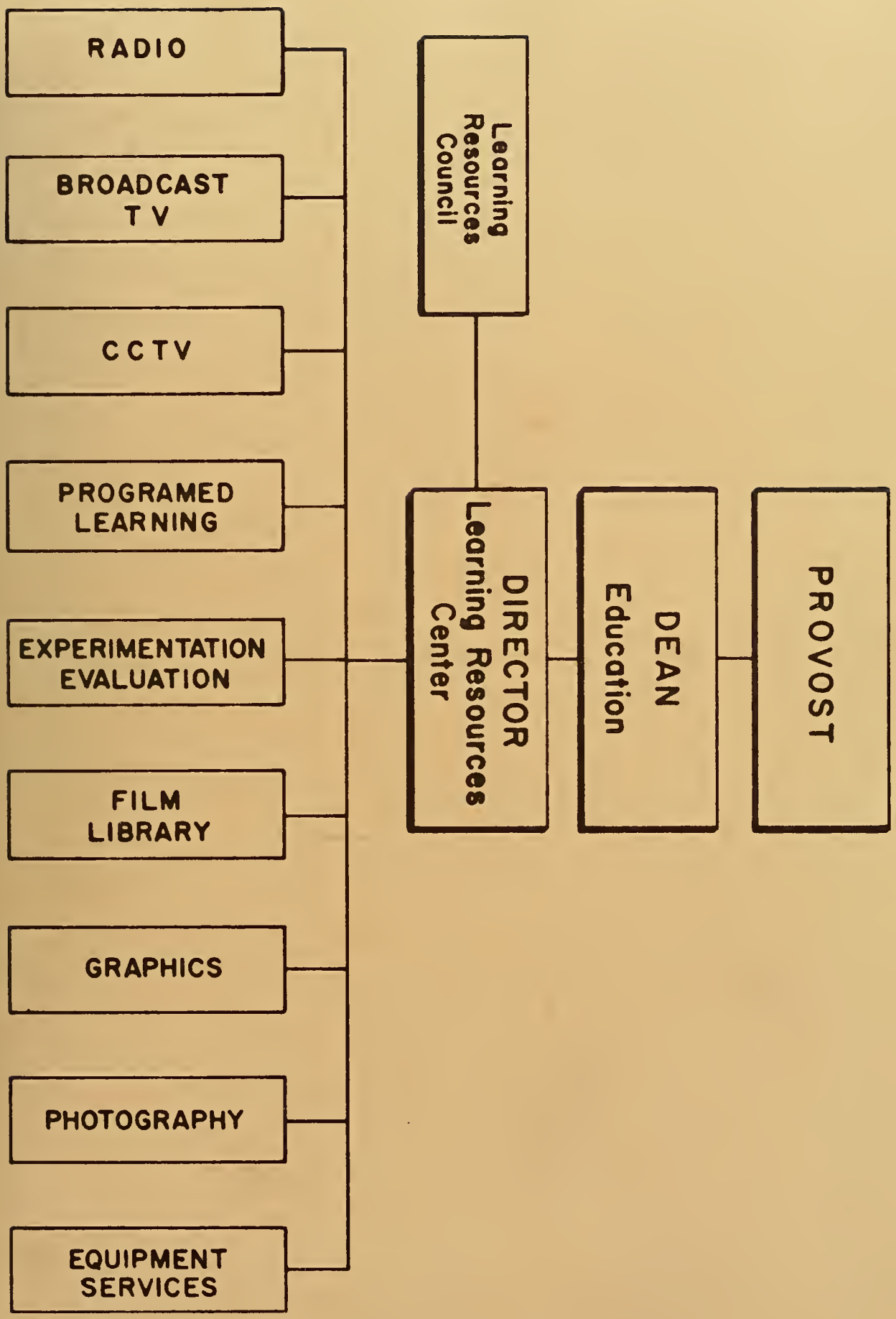
We have not made much progress.

The building addition that we were planning to house the center has been deferred and is still several years away. Broadcast radio and television have been placed under the Secretary of the University. No plans for multiplying the effectiveness of teachers around campus with television seem to be under way outside of observation in the School of Education. A new Library is being planned with absolutely no consideration of the exciting possibilities for individual study in electronic carrels or the possibility of combining book and newer media resources in one area on campus. We have no professionals (AV Consultants) on our staff to bridge the gap between teachers and the center and to help teachers to discover and use media effectively. Our film library is relatively poorer than it was several years ago as our films get older, are withdrawn, and seldom replaced or added to. Our equipment is so limited that we must often move it when it should be a permanent part of most teaching stations.

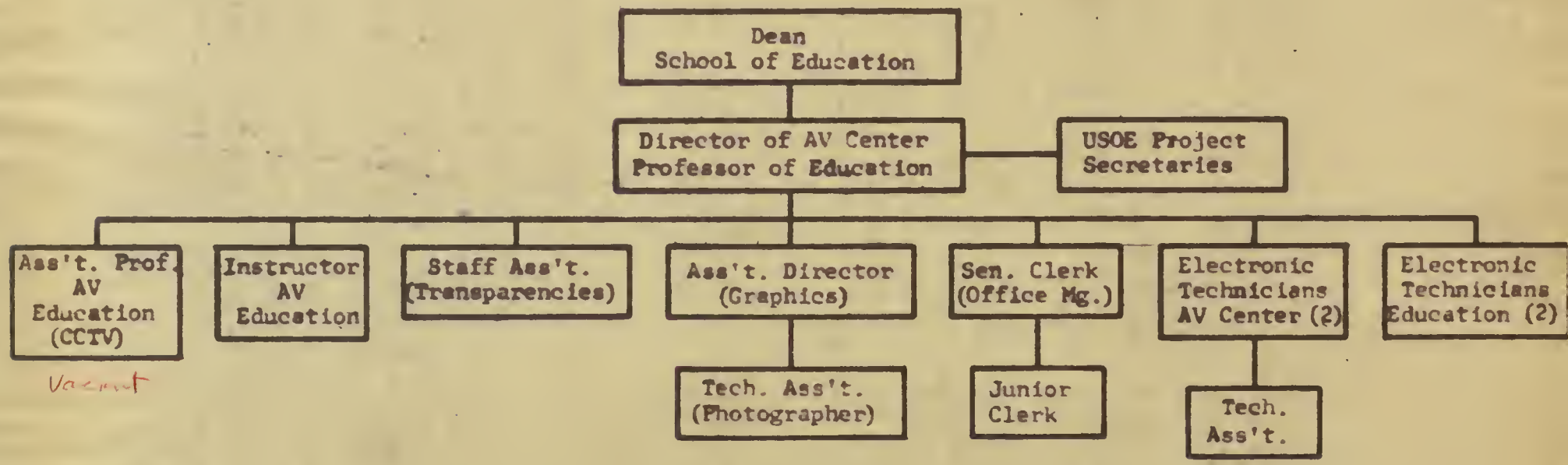
On the other hand we have made some important progress. We have additional technical help which has made our technical support all over campus outstanding. Our one photographer and one graphics person turn out a large quantity of outstanding visual material to support instruction. Our film bookings are kept up to date and our electronic inspection keeps complaints about what we have very low. We have established a Northeastern Regional Media Center for the deaf with support of more than $100,000 per year from the U.S. Office of Education. We have established a transparency master and duplicating center for the use of the deaf and the University. Our television installation in the School of Education is moving toward an outstanding system. Plans are under way for excellent AV facilities in the Machmer Addition.

We have some immediate problems that need attention. We need some promotions for our technical people who are doing work far above their classifications. If it were necessary to replace these people, we could not do it at present ratings. We need a replacement on our teaching staff. We need a much higher budget for equipment and materials.

We also need to have a Learning Resources Council established by the Provost or Senate to help us to plan for the improvement of instruction with newer media all over campus. The day of the verbal lecture for presentations and books for individual study must give way to multi-media resources for both. It will take a broadly based faculty-administration group to bring this about.


RADIO
BROADCAST TV
CCTV
PROGRAMED LEARNING
EXPERIMENTATION EVALUATION
FILM LIBRARY
GRAPHICS
PHOTOGRAPHY
EQUIPMENT SERVICES
Learning Resources Council
DIRECTOR Learning Resources Center
DEAN Education
PROVOST

AUDIOVISUAL EDUCATION AT UNIVERSITY OF MASS.



Faculty Involvement

In the early stages of the development of most academic organizations the faculty is closely involved in decisions on policy and administration, but the involvement is likely to be personal and unstructured. As problems arise, the Head drops in to the offices of his faculty for debate and discussion on the matter. As the organization becomes larger and the problems more complex, a more formal and structured pattern usually evolves--evolves through study and try-out of various forms over the years to find the best form for the particular organization. This process has been going on in the School of Education for two decades and now is rather well established. The attempt has been to evolve a structure which would bring about maximum participation of faculty in major policy and administrative problems without taking too much of their time on minor ones. Some phases of the structure are discussed below:

(a) The Dean's Open Door Policy. Ever since the present Dean became Head of the Department of Education in 1945 he has maintained an open door policy for his faculty. The directions to his Secretary are that faculty are to be admitted at once if noone else is there first.

(b) The Faculty Assembly. This is composed of all professional faculty of the School. Its function is to recommend to the Dean on all major policy matters and on the undergraduate curriculum. An elected Rules Committee has the task of screening resolutions and topics that come before the Assembly to insure that minor details are not permitted to take the time of the Faculty.

(c) The Council On Graduate Studies. This is composed of all faculty of the School who have been appointed to the University Graduate Faculty. Its function is to recommend to the Dean on all matters pertaining to graduate work.

(d) The Dean's Advisory Council. This is composed of all faculty of the School of the rank of associate professor or professor who have served the School for at least a year. Its function is to advise the Dean on any

matter he may wish to bring before it.

(e) The Personnel Committee. This is an elected committee of the Faculty Assembly. It rates the faculty for merit raises, reappointment, promotion and tenure and recommends to the Dean. In addition it recommends to the Dean on all candidates for positions in the School where the proposed rank is above that of assistant professor.

(f) The Graduate Committee on Admissions and Standards. This is a committee of the Council on Graduate Studies appointed by the Dean. It recommends on all atypical or borderline candidates for graduate degree work and on graduate students who are not doing acceptable work.

As stated above, all of this has been evolutionary. As the faculty grew larger and larger more and more responsibility was given its various committees. Presently, the Dean has much confidence in the recommendations of the faculty and its various committees, Councils and Assemblies and it is rare indeed when action is taken contrary to these recommendations. This does not mean that the Dean always followed the recommendations, but when there was disagreement the debate was usually continued until some compromise could be reached.

A Look To The Future

Since the administration of the School is to change this year, on both the Dean and Assistant Dean level, it would seem appropriate to re-appraise the functions of the School and the part it should play in the future education of the state. Naturally, this re-appraisal must be made in the light of the discussion on support in the preceding section. If adequate support is forthcoming, the School can and should go far in its educational impact on the New England area. We must assume that this support will be given to Education as it has been to the other schools and colleges and that with this support the School can move ahead in all the broad categories of teaching, research and service. If adequate support is not forthcoming, then an "agonizing re-appraisal" must be made in order to limit the programs and to establish priorities.

This re-appraisal should be made by the faculty and the new administration of the School, using whatever consultants that may be desired, and it is not for me to sway the decisions. However, I feel that I would be remiss in my responsibilities if I did not discuss briefly some of the suggestions that have already been made by various people.

One persistent suggestion is that the School should cancel all its undergraduate teacher education and concentrate only on graduate programs. The arguments for this action are persuasive; these students could just as well go to one of the state colleges; we should not duplicate programs that can be handled by other state institutions; we are going to be short of faculty and space and undergraduate programs are very profligate of both; we should be concentrating on educating leaders in education since they are the innovative and decision making agents. Persuasive as these arguments are I think they fail to take other things into consideration, namely, these students come here for an education and it would be unfair to say they can elect just about everything else except teacher education; these students will be teaching in the public schools and will more and more determine the type of student to come to the University; the University should be in the vanguard in improving teacher education in the

Commonwealth. This is not to say that the School does not have certain unique functions in undergraduate teacher education. On the contrary, the School should be the innovator of new ideas and new practices--the place where new suggestions can be implemented, and the place where students are educated to be agents of change in a changing society. The School, also, should be the base for the more esoteric programs such as Special Education and Distributive Education which require strong support from the allied fields of psychology, sociology and business as well as special facilities and equipment. The School has done very little in any of the above areas, not because of lack of motivation, but because the facilities and budget and faculty positions were not available. The fact that we have not progressed in these areas should not be considered a valid argument that we should not.

Another persistent suggestion is that the School should drop all specific career programs such as administration, guidance and curriculum specialist even on the doctoral level. This suggestion would have the School concentrate on educating top-level educational researchers and statesmen and on making high level comprehensive innovative studies and changes. They point to the fact that (1) change is occurring with ever greater momentum and (2) that education now is a part of a very complex and changing social organism that cannot any longer be isolated and (3) that Education, as a study, should no longer be isolated from other social areas but that the School should be part of a team with other disciplines to be the authors of change and to educate people to be the authors of change. These people would point to the need for comprehensive community planning with experts from various disciplines on a team basis, all of them trained in research, and innovators by motivation. While all of this is undoubtedly valid and persuasive it is doubtful if this narrow concept, of very high quality though it may be, can meet the broad objectives of a state university--Harvard perhaps, Stanford perhaps, but not a state university whose responsibility is to the whole educational system of the state at all levels and not only to a few positions in the

top echelon. It is to be noted, however, that this suggestion cannot be dismissed. The School has a commitment to train researchers and top-flight innovators and it should become, as part of its service function, involved in comprehensive community planning, but that these should not become the School's sole function.

My conclusion now is the same as it always has been, namely, that the School should move ahead with its programs on all levels of public school concern from kindergarten through college; that programs in Special Education, Distributive Education, and other specialties should be added; that emphasis on research and educational hardware and educational innovation should be stressed, and that the service function should be strengthened and upgraded to make available to the state teams of high quality experts to recommend on community problems on a broad scale. For two years a Future Developments Committee of the School has been engaged in taking a long look into the future, and the report of its findings deserves careful attention. The report recommends the broad objectives for the School rather than the narrower one.

My conclusion is also the same now as it always has been so far as support is concerned. If the University wants a strong School of Education --one which will make a real impact on the education of the state and which will bring prestige to the institution--it must provide adequate support in terms of facilities, faculty, and operational budget. The time has come when some hard and firm decisions must be made; in fact, the time is already very late.

One of the phases of the report which the Future Developments Committee emphasized strongly was the recommendation for a more decentralized administration by dividing the School into various areas for curricular and administrative purposes. At present there is a loose form of area decentralization for curricular purposes but until now the areas and the area coordinators have not served in an administrative capacity. In this respect I have tended to follow the Harvard and Stanford pattern rather than that found in most Schools of Education. It is interesting to note that after

many years of the loose curricular area organization the faculty of the Harvard Graduate School of Education has decided in its latest report to continue this form rather than to departmentalize. There are of course, good arguments on both sides and there is always the tendency to think the other other form is preferable. Certainly the arguments for departmentalization are impressive, particularly as a School becomes larger and larger. My own impression has always been against such an organization in a School of Education. I believe that in these days when we are moving away from training the technologist or narrow specialists in favor of educating the generalist and the decision makers and the innovators and emphasizing interdisciplinary teams that the arguments against departmentalization are growing stronger rather than weaker.

Another problem which must be solved if the School is to gain higher prestige is the problem of quality of faculty. The School currently has several very high quality faculty but not nearly enough. It is difficult to see how such high quality people can be recruited under present conditions. In 1965 the School, which in many respects is the second largest on campus, was allocated 2 positions and $22,000; in 1966 the School was allocated 2 positions and $20,000; in 1967 the School was given no new positions. As pointed out elsewhere, in three years the enrollment has increased 66% of which a large proportion was in graduate enrollment. We obviously needed many more than the four positions just to get our classes taught and to keep the show on the road. The amount of money allocated was barely adequate to bring in young people just out of graduate school. While several of these are turning out well, it takes a long time to develop them into leaders in the field. In the interim period the sole solution appears to be to recruit on the professor level and this demands an allocation of $18,000 to $20,000 for each position. We hope that the new administration will be given adequate support to do this. It is the most important immediate need of the School and upon its successful implementation all else depends.

OPERATIONAL BUDGET. SCHOOL OF EDUCATION

	1962-63	1963-64	1964-65	1965-66*	1966-67*
03	22000	29940	42665	33150	36000
10	5000	5500	9200	8200	8000
13	5700	6250	7255	9800	9800
14	1400	1400	1400	2400	2900
15	5000	7500	8210	2500	1000**
Total	39100	50590	68730	56050	57700
Teaching Positions	3	4	5	2	3

**Plus an additional undetermined sum for special orders, none of which have been approved.
*Including supplementary budget.

OPERATIONAL BUDGET. AUDIOVISUAL CENTER

03	700	2500	2500	1900	3100
10	200	500	550	550	550
11	500	200	200	200	400
12	1200	3500	3500	3500	4000
13	4000	5400	6300	6300	6500
14	350	600	300	550	550
15	2530	5000	5000	5000	4000
Total	9480	17700	18350	18000	19100
Personnel - Teaching - Education					
Instructor	1	3	3	4	5
Instructor "A"			1	1	
Asst. Prof.	12	14	17	13	11
Asst. Prof. "A"	1	1	1	1	2
Assoc. Prof.	3	3	2	7	8
Assoc. Prof. "A"				1	1
Professor	3	3	3	3	3
Professor "A"		1			
Visiting Lecturer				1	3
Dean, Assistant			1	1	1
Dean, Head	1	1	1	1	1
Positions Unfilled				2	3
	21	26	29	35	38
Personnel - Other - Education					
Electronic Tech.	1	1	1	3	2
Technical Asst.				1	1
Principal Clerk			1	1	1
Sr. Clerk-Sten.	1	1	1	1	1
Jr. Clerk-Sten.	3	4	5	7	8
	5	6	8	13	13
Personnel - Audiovisual					
Asst. Director	1	1	1	1	1
Staff Assistant		1	1	1	1
Radio Maint. Super.	1	1	1	1	
Tech. Assistant	1				1
Electronic Technician	1	1	2	2	2
Sr. Clerk-Typist	1	1	1	1	1
Jr. Clerk-Typist	1	1	1	1	1
	6	6	7	7	7

ENROLLMENT. SCHOOL OF EDUCATION

SINCE 1960-61*

Year	First Semester			Second Semester			Total		
	U	G	T	U	G	T	U	G	T
1960-61*	553	197	750	598	203	801	1151	400	1551
1961-62	748	239	987	741	223	964	1489	462	1951
1962-63	866	277	1143	814	323	1137	1680	600	2280
1963-64	903	402	1305	890	459	1349	1793	861	2654
1964-65	1023	666	1689	1035	665	1700	2058	1331	3389
1965-66	1062	776	1838	1066	951	2017	2128	1727	3855
1966-67	1286	791	2077	1449	942	2391	2735	1733	4468
Increase as a percentage of 1960-61							138	333	187

FACULTY POSITIONS. SCHOOL OF EDUCATION

SINCE 1960-61

September 1961	19 positions
September 1962	23 positions
September 1963	28 positions
September 1964	34 positions
September 1965	35 positions
September 1966	39 positions
September 1967	38 positions
Increase as a percentage of 1960-61	100%

From the above it can be seen that in the six years since we entered the new School of Education building:

(1) our undergraduate enrollment has increased by 138% -- or an annual average of 23%.

(2) our graduate enrollment has increased by 333% -- or an annual average of 56%.

(3) our total enrollment has increased by 187% -- or an annual average of 31%.

(4) our faculty positions have increased by 100% -- or an annual average of 17%.

July 10, 1967

Dr. Oswald Tippo
Provost
University of Massachusetts
Amherst, Massachusetts

Dear Dr. Tippo:

I submit herewith my first Annual Report for the activities of the School of Engineering for the period July 1, 1966, to June 30, 1967. The format of the report is modified from that suggested by Dr. McCartney in that statistical data have been placed in appendices of the report.

The progress made by the School of Engineering during the past year reflects the excellent support provided by your office and all of the people associated with the School of Engineering. This support is gratefully acknowledged.

Sincerely yours,

K. G. Picha, (NEW) Dean
School of Engineering

KGP:oht
enc.
c. c. to Dr. McCartney ✓

Annual Report for 1966 - 1967

School of Engineering

I Introduction

The format of the annual report for the School of Engineering will be changed from previous years by placing much of the statistical data requested in appendices as follows:

Appendix I - Appropriation data

Appendix II - Personnel data and Organization Chart

Appendix III - Students served

Appendix IV - Professional Activities of the Faculty

The body of the report will be concerned with accomplishments and progress planning,departmental report summaries, and finally, problems faced by the School.

Before discussing any of these points, I should first express my deep gratitude to the faculty, department heads, and secretaries and technicians for their generous help during my first year at the University of Massachusetts. Without everyone's splendid spirit of cooperation and enthusiasm to develop a quality School of Engineering, none of the progress which we are proud to report herein would have been possible.

II Accomplishments

1. Undergraduate Curricula Studies and Accreditation

Early in the Spring of 1966 an ECPD accreditation team visited the School of Engineering to determine to what extent our accreditation should be continued. This visit is scheduled on a regular basis and did not reflect any problems in the School. We were gratified to learn in the fall of 1966 that four of our curricula were accredited for the maximum period of time possible (6 years) while the fifth program received a four-year accreditation.

The ECPD accreditation committee found points in each of our programs to criticize and considerable attention has been given to these points. Before changes in curricula could take place in a reasonable way it was agreed by the Executive Committee of the School that some kind of framework for curricula modification might be worth while. A faculty committee chaired by Associate Dean Lindsey met regularly through the year and proposed a 128 credit hour undergraduate program with changes in mathematics and physics requirements. The report of the curriculum committee was well done and will be taken to the Executive Committee for approval early in the fall of 1967.

At the same time that the undergraduate curriculum committee was meeting, a second committee also chaired by Associate Dean Lindsey was meeting to consider the basic engineering courses in the School of Engineering. Each degree granting department has agreed to provide approximately one-third of a man during one semester to teach in the basic engineering program. A report submitted by the Basic Engineering Committee suggests that few changes be made in

the first course while the second course would be modified somewhat to include more numerical methods approaches to the solution of engineering problems. The computer will continue to be a major tool in the basic engineering work.

Recognizing the responsibility of the School of Engineering to participate in the exciting national program of aerospace exploration and utilization, a new undergraduate program in Aerospace Engineering was developed by the faculty of the School of Engineering and approved by the Board of Trustees to begin operation in the fall of 1967. The Department of Mechanical Engineering in cooperation with other departments in the School will administer the program which offers another area of intellectual activity for our students. One-half of the freshmen choosing to major in the Mechanical and Aerospace Engineering Department have elected the Aerospace program.

The School is also seeking ways to inititate a Cooperative Engineering Program which will provide a balance between the academic training a student receives and the creative design aspects of engineering which characterize the practice of engineering. At the present time, we are restricting the program to majors in Mechanical Engineering who are in the upper half of their class. As we gain experience with the problems of administering the programs, expansion to include other engineering students interested in gaining industrial experience while studying engineering at the University will take place.

2. Relations with High Schools

A much closer relationship with the secondary schools of the region is anticipated as a result of our participation in the new Engineering Concepts Curriculum Project entitled the "Man Made World". The School of Engineering is cooperating with the Amherst Regional High School which will offer the ECCP program in 1967-68. Amherst Regional will be the first high school in the Commonwealth to offer this course. The instructor of the course is participating in a six week NSF Summer Institute in Boulder, Colorado, which seeks to train teachers for the program. A proposal has been submitted to the National Science Foundation to obtain support for our offering a similar Summer Institute in 1968. The objective of the Institute is to assist high schools in New England who might be interested in instituting this course in their curricula. The Amherst-Regional teacher will serve as Associate Director of the program providing a real link between the School of Engineering and the High School.

The ECCP course is for embryo journalists, businessmen, lawyers, medical doctors, teachers, and really all citizens who will take part in guiding our society in years to come. The authors write from a conviction that the world is increasingly shaped by technical accomplishments -- it is largely a man-made world. With expanding scientific and technological knowledge, man now believes he can shape his own environment and he need not leave his destiny to chance. He can change the world toward what he wants it to be rather than accept it as it is. This is the point of view of the engineer who thinks of the world in terms of how it can be manipulated to serve man.

In addition to efforts related to the new ECCP program, faculty members continue to visit high schools in the region to discuss new areas of technology and how youngsters might participate in these developments by studying engineering.

3. Relations with Community Colleges

The sudden impact of an enlarged transfer student problem hit in the summer of 1966 when 75 transfer students enrolled in the School of Engineering at various levels. Of these, 32 were from Community or Junior colleges in the Commonwealth and were admitted under the priority system established by the Board of Trustees for students from these schools. Fifteen additional students were from in-state two-year technical institutes with whom our School of Engineering has had close working relationships for many years.

With the recognition that, with the growth in size and number of these two-year schools, the student numbers would increase rapidly, the School of Engineering made a concerted effort during the past year to establish closer working relationships with these institutions. Assistant Dean Marcus visited the faculties in the mathematics, physical sciences, and technology areas of each of the schools in the fall of 1966. He outlined, in detail, by means of a brochure given each of the schools, the programs of the School of Engineering -- departmental curricula, texts, prerequisites, syllibi -- and offered the suppport of our School in the development of programs -- terminal as well as transfer -- wherever such aid might prove feasible.

Faculty and administrators from each of the two-year schools were invited to a one-day seminar on the University campus in the spring to discuss common problems and the possibility of future cooperative programs.

These contacts opened a dialogue which led to a whole series of other contacts of other sorts which served to aid the various two-year schools. Thus, for example, one school sent the Head of its Technology and Physical Sciences Program back to the University campus to discuss the establishment of a number of laboratories in which he was interested. He met with and was aided by faculty members in both Engineering and Physics.

One shcool sent a group of students to Amherst to visit the Engineering facilities. The prospective transfer students in this group had an opportunity for special academic counseling.

One faculty member from one of the Community Colleges has a grant to study on the University campus. His goal is "retreading" and upgrading and he is taking a number of courses in mathematics, engineering, and computer science. At the same time, arangements have been made to have him visit and talk with various faculty members who are involved in the development of new courses at the lower division level. The continuing rapport should be of considerable value, not only to both University and two-year college faculty but also to those students desirous of transferring to the University upon completion of their work for the Associate Degree.

4. Graduate Programs

The most significant accomplishment with respect to graduate programs in the School of Engineering is that each of the five departments now offer degrees through the doctorate. The Board of Trustees approved the PhD program in Industrial Engineering in the summer of 1966, the PhD in Mechanical Engineering in the spring of 1967 and the PhD program in Electrical Engineering was approved June 30, 1967. These new programs reflect clearly the excellent support the School has received from the Administration of the University.

Associated with the approval of the new doctoral programs in the School is the responsibility we have to make certain that the programs are of real quality and that the students accepted into the program are also of high quality. The quality of the courses offered at the graduate level is clearly determined by the faculty and their involvement in research activities. The School of Engineering has had a strong faculty which was strengthened considerably in the last two or three years. On the other hand, one cannot offer doctoral programs of great breadth as well as depth without a considerable expansion of the faculty.

Recruiting efforts of all department heads this past year are worthy of special commendation. Nineteen new faculty members were added in the School. Our competition for these people consisted of good midwestern and western institutions. It is our belief that these people were attracted to the University of Massachusetts because of the kind of exciting and dynamic environment that exists. The new faculty members are listed below:

Chemical Engineering

Professor M. M. Vampee	PhD	University of Louvain, Belgium
Asst. Prof. W. L. Short	PhD	" " Michigan

Civil Engineering

Professor R. T. Scrinde	PhD	M.I.T.
Assoc. Prof. D. D. Adrian	PhD	Stanford University
Asst. Prof. J. H. Nebiker	PhD	Swiss Federal Institute of Tech.

Electrical Engineering

Asst. Prof. I. B. Thomas	PhD	University of Illinois
Asst. Prof. R. E. McIntosh	PhD	Iowa State University
Asst. Prof. D. Wiggert	PhD	University of Wisconsin

Industrial Engineering

Visiting Asst. Prof. C. G. Drury	PhD	Univ. of Birmingham
Asst. Prof. R. J. Giglio	PhD	Stanford University
Asst. Prof. R. A. Rubel	DBA	Harvard Business School

Mechanical Aerospace Engineering

Professor G. Boothroyd	PhD	University of London
Professor W. A. Nash	PhD	" " Michigan
Assoc. Prof. C. R. Poli	PhD	Ohio State
Asst. Prof. L. L. Ambs	PhD	University of Minnesota
Asst. Prof. J. G. McGowan	PhD	Carnegie Tech
Asst. Prof. C. W. Nelson	PhD	Case Institute of Technology
Asst. Prof. G. A. Russell	PhD	University of Connecticut
Asst. Prof. G. A. McLennan	PhD	Carnegie Tech

The Mechanical and Aerospace Engineering Department also recruited Professor Murthy and Assistant Professor Zinsmeister for the academic year, 1966-67. Dr. John Zahradnik was added to the Mechanical and Aerospace Engineering graduate faculty on a joint appointment during the past academic year.

Providing a stimulating environment for new faculty as well as faculty members currently in the School will be a major task for Department Heads and the office of the Dean. Of greatest importance is the recruiting of first-rate graduate students. Although a definite calculation of quality of incoming students is not possible at this point in time, there is evidence that the average quality of our students may increase by nearly half a grade point (2.5 to 3.0). This will be a significant increase but efforts will be made to increase the quality even further.

We look forward to the awarding of our first doctorate in Chemical Engineering during the academic year.

5. Research

Perhaps the most significant development of the year was our being selected for an award by the Department of Defense under Project Themis. Approximately $300,000 a year for at least three years will be available to support a new interdisciplinary research program centered about deep-sea submersible problems. Faculty interests in propulsion and energy conversion, materials and materials processing, guidance and controls, structures, deep-sea environment, deep-sea hydrodynamics, and information management and systems optimization will be directed toward solving major problems of deep-sea submersible design by a Deep-Sea Submersible Board, chaired by Professor of Civil Engineering, Charles E. Carver.

Project Themis is directed toward strengthening institutions and was originally announced as a center of excellence program of the Department of Defense. The program seeks to establish university-administered programs in specialized areas relevant to the defense mission and to develop the potential of already strong groups. In selecting the University of Massachusetts for an award the D.O.D. used the following criteria:

(1) Current capability: The existence of a research capability at the institution that is sufficiently strong in areas of particular interest to the national defense to serve as an initial base for the proposed research program.

(2) Current leadership: The availability of sufficiently high-caliber leadership to give reasonable assurance that the institution's objectives, as stated in the proposal, can be attained.

(3) Organization: The willingness of the college or university (a) to provide a formal--or ad hoc-- organizational structure that will encourage multidisciplinary approaches to the investigation of broad problem areas and (b) to maintain a balance among the various science and engineering areas as necessary to permit the orderly development of newly gained knowledge.

(4) Coupling mechanisms: The willingness of the college or university to assist in (a) coupling the output of the research program to the potential users of such knowledge by publishing suitable reports, data and handbooks; (b) providing occasional advisory assistance to the Department of Defense and its agencies; and (c) participating in joint seminars and symposia.

The increasing level of faculty research activity is evidencedin Appendix IV, the professional activities of the faculty. In addition to the grants and contracts received and noted in Appendix IV, it should be mentioned that forty-five proposals were submitted by the faculty of the School during the past year. Although our sponsored research increased substantially (on a dollar basis) during the past year, we anticipate dramatic increases during the coming year. The growth in research and graduate activity which we seek so diligently will lead to a space problem which will be discussed in another section.

Three new interdisciplinary research laboratories were established in the School of Engineering during the past year to be conerned with research in Fluids, Materials and Hybrid Computation.

These laboratories were established with the following educational objectives in mind:

(a) Ability to adjust to new needs and new goals expeditiously without disrupting efforts to meet existing needs

(b) Offering of degrees in established engineering areas but also to provide the mechanism to phase degree programs either in or out to meet institutional objectives within the funding limitations of the institution

(c) Provide a research and teaching environment which will optimize faculty efforts. Some laboratories which are of interest to faculty members in two or more departments should be brought under a faculty committee so that available and appropriate resources can be focused on important problems of interest to the faculty members concerned. Other laboratories which have characteristics unique to individual research interests of faculty members will continue to serve the individual researcher and his students.

(d) Conflict and competition between administrative units should be minimized so that flexibility can be enhanced and an optimum research environment created for the faculty and students of the School within the resources available. This must be kept at the forefront of our thinking.

The laboratories are organized to be administered by a faculty committee reporting to the Office of the Dean. The Committee is responsible for presenting needs, equipment, space and service support. Priorities on the use of the facilities will be determined by the committee.

Proposals for research support of faculty members working in the interdisciplinary laboratories will be reviewed by the committee for recommendations to the Executive Council for space, equipment and personnel needs that will be generated if the research proposal is supported. Grants and contracts, however, will continue to be administered by the faculty member through the department head and dean. Selection of graduate students and service personnel to work on sponsored research will continue to be the concern of the principal investigator. Equipment purchased on grants and contracts will be considered to belong to the laboratory; however, it is obvious that the principal investigator responsible for bringing in the funds to purchase such equipment will have full use of the equipment during the grant or contract period.

The primary objective of reorganizing certain of our research laboratories and establishing a mechanism for new interdisciplinary research laboratories to be created is to optimize the research facilities and service available to support first-rate faculty and student research. We hope to maintain a completely open mind on this matter and will be anxious to make changes as experience determines.

6. Services to Industry

Dr. Lenz (with Drs. MacKnight and Porter) taught a new course entitled, "Introduction to Polymer Science and Engineering", to three classes, two of which were specifically for the General Electric Company and the third for a mixture of Monsanto Company engineers and other students.

The Industrial Engineering Department has provided the 8th Air Force with a short intensive course of one week's duration in the area of quality control and systems development. The Department again offered its Annual Spring Seminar where participants are invited from industry to explore topics of current interest.

The Civil Engineering Department is setting up a computer retrieval system for ASCE publication.

Commonwealth Technical Resource Service

COMTECH has been established under the direction of Dr. Howard D. Segool. It links the University with the industrial, business, and commercial environments of the Commonwealth, particularly as they relate to the School of Engineering. Its goal is to more actively engage the University in the application of modern technology in industry, business, and commerce, and to influence the establishment of technologically-based growth industries in the Commonwealth. Functionally, COMTECH operates in an interdisciplinary fashion, and coordinates with the full range of scientific, technological, and business resources available in the University system.

Under assignment by Governor Volpe and acting thru COMTECH, the University has developed the FIVE YEAR PLAN to facilitate the transfer of technology to Commonwealth industry, business, and commerce under the matching fund program of Public Law 89-182, the State Technical Services Act. The PLAN has been certified by the Executive Office to the U. S. Department of Commerce which administers the Law, the University has recently been named the Designated Agency for implementation of the PLAN, a request for a State appropriation of matching funds is underway, and COMTECH currently is developing implementing projects in cooperation with seventeen qualified participating institutions throughout the Commonwealth. An FY68 Annual Program will thereby result for implementation.

Simultaneously, COMTECH maintains STSA liaison with its counterpart agencies in the other New England states thru the New England Regional Plan Committee STSA, to effect selective regional benefits from this activity.

III Faculty Recognition

Two distinguished and respected members of our faculty retired at the end of the year. Professor Hans Duus of Chemical Engineering Department was awarded the Outstanding Teacher Award in 1966 (an honor most definitely deserved). Professor Duus has had a distinguished "second career" with us and we hope his "third career" continues to center on the School of Engineering.

Professor John Swenson of the Mechanical Engineering Department has been a valuable teacher and student friend. We wish him well in his future endeavors.

Professor Bernard Lovell of the Electrical Engineering Department has resigned and will attend the University of Connecticut for doctoral studies on an NSF Science Faculty Fellowship.

Professor Daniel Sobala of the Mechanical Engineering Department resigned early in the year to enter industry.

Professor Robert Glass of the Mechanical Engineering Department resigned to accept a position at Ohio Northern University.

Professor Charles James of the Industrial Engineering Department resigned to accept the position of Department Head at the University of Rhode Island.

Professor Edward J. Rising will be on leave next year, holding the Lucas Chair at the University of Birmingham.

Professor Charles Bissey will be on sabbatical leave studying for the doctorate in ocean engineering at the University of Rhode Island.

Professor Carl Keyser will be on leave for study and writing.

IV IMMEDIATE PLANS

Substantial time and effort during the coming two years will be devoted to assimilating the progress we have made during the past year. The creation of the Interdisciplinary Research Laboratories will, I believe, allow us to move in the direction of providing an academic environment supportive of greater faculty productivity in research as well as in the teaching laboratories. On the other hand, the development of these laboratories cannot drain strength from the academic departments. Only by careful planning and coordination can these laboratories be fully established as a vehicle for enhancing the reputation of the University. It is hoped that all members of the School of Engineering family will recognize that problems will develop but solutions can also be found by cooperative people whose goals are to strengthen the School and the University as well as their individual areas of interest.

We must continue to give significant attention to recruiting outstanding students at all levels. Giving the correct image of the School of Engineering and the University through increased public relations activities will be another immediate goal of the School.

It is doubtful that any new academic programs will be proposed by the School next year. We will, however, be deeply involved in ocean engineering research as a result of Project Themis support and will have developed sufficient competence and research experience to offer an MS and PhD in ocean engineering by the fall of 1969. A committee will be appointed early in 1967-68 to begin planning the ocean engineer-

ing program and to make recommendations as to how the program should be administered.

The excellent people added to the existing strength in Mechanical Aerospace Engineering in the area of materials and materials processing particularly oriented toward ceramics and metals should provide the strength needed to broaden the Polymer Science and Engineering Program to perhaps a Materials and Materials Processing graduate program. The mechanics of broadening the program will be discussed with Dean Moore and Dr. Roger Porter during the coming year.

The initiation of the Aerospace Engineering undergraduate program will result in graduates as eary as the fall of 1969. We should begin planning during the coming year to initiate MS and PhD programs in Aerospace Engineering in 1969-1970. One can easily justify the initiation of these programs by quickly scanning the US House of Representatives hearing on the FY68 NASA budget. A national goal has been proclaimed that we shall continue the Space Program beyond placing a man on the moon. Engineering talent trained to the highest levels of sophistication will be needed over the next decade to support our nation's endeavors in space.

V Long Range Plans

About the first of September, 1966, I requested each of the departments in the School of Engineering to consider what role they wish to play in developing new programs in the School over the next ten years. In addition to the three new programs mentioned above which we shall be planning for immediate initiation, three other programs should be initiated in the next five years. These are BS through PhD in Systems Engineering, Environmental Engineering and Biomedical Engineering. The latter two programs are to some extent also of interest to other academic units at the University.

Each of the departments responded to my memo and Xerox copies of their reports are attached as Appendix V. One interesting aspect of the five-year planning for the School is our enrollment projection. Studies by the Engineering Manpower Commission predict a leveling off of undergraduate students in engineering to about 10 per cent of the student population. This percentage is approximately the same as the local situation at the University. Assuming no changes in this percentage, we should grow to about 2000 undergraduates in the next five years.

The most dramatic growth will occur in the graduate programs in engineering. The U. S. Office of Education predicts that the number of doctorals in engineering will climb to 7300 by 1976 (one out of every five doctorates awarded). The Office also predicts that 34,000 master's degrees will be awarded in 1976 compared to 13,700 in 1966. Because the School of Engineering is entering into graduate educaton in a serious way at least two decades late, our graduate program growth should exceed the national levels considerably. Our predictions are that we will have at least 600 graduate students (unless restricted locally) by 1972-73.

Associate Dean Lindsey has conducted an excellent space study of the School of Engineering in connection with our long range planning. His study indicates that when the space loaned to Computer Science and the Computing Center is returned to the School that we can accommodate growth at the levels planned until 1970-71. Further growth will be impossible without a new building. To handle our needs for the period 1970-1975 a building of 100,000 gross square feet will be needed on line in 1971. With planning money scheduled by the Planning Office of the University for FY69 such a schedule would be extremely tight. It is imperative however that planning money be made available in FY69 or serious problems will develop in the School.

VI Problems

1. As indicated above and reinforced by Dr. John Eldridge's annual report, one major problem as we view the immediate future is that of space. Although we are in a reasonably good situation at the present time as far as the entire School is concerned, the Chemical Engineers are already beginning to experience severe space problems. If we are to grow over the next five years we must begin planning a new building in FY69 at the latest. The building should contain 100,000 gross square feet.

2. Dr. John Dixon, Head of the Mechanical Aerospace Engineering Department, raises the question of library services and organization. Others have also commented on the problem in verbal reports. The problem is not connected with existing personnel but rather with the broader situation of departmental versus divisional libraries. The Executive Council of the Schools stands on record as being completely in favor of divisional libraries (i.e. Mathematics, Physical Sciences, and Engineering) as the only feasible way of providing first-rate library services to students and faculty members in the School of Engineering. Excellent information services are an important facet of creating the stimulating and satisfying environment for creative and productive work in the School. Engineering leans heavily on the physical sciences and mathematics for its underpinnings and a first rate collection in these areas plus easy and rapid access to this collection is of great importance.

3. The faculty of the School of Engineering seek ways to recruit outstanding students at both the graduate and undergraduate level. The former situation will be solved by bringing together faculties of national and in some cases international reputations and developing support for the graduate students. Recruiting outstanding undergraduate students seems to be a more difficult problem in view of the limitation on out of state student enrollments. We must seek, under these limitations, to attract a greater number of first-rate Massachusetts resident students. Our competition for good students in Engineering represents some of the finest engineering schools in the nation. Better scholarship awards independent of need must be made available so that we can attract 10-15 students of outstanding scholarship and leadership ability to set the pace for classes. Some efforts have been made in this direction but much greater support is required before significant changes can be made.

The writer believes that to a very great extent the youngsters of the Commonwealth do not realize the quality of training they can obtain at their State University. Much of this reflects the history of the institution, but I strongly believe that a much more active public relations effort which seeks not to propagandize but simply to tell the actual story of the University's progress would do much to attract a higher level student to our University.

4. Secretarial service for our departments has improved to some extent during the past year but as we add productive faculty members in each department, dramatic improvement in secretarial service is required. This is another facet of providing the environment conducive to productive activity. Every effort will be made to provide adequate clerical and secretarial service as well as to move toward one man offices and reasonable telephone service.

5. Because of the background of "shop teaching" in the School of Engineering we are blessed with excellent technician services. Several of the technicians urgently need upgrading in ranks because of their excellent craftmanship and devotion to the School.

The problem that faces the University, I believe, is how we can provide reasonable reasearch services (i.e. machinists, electronic technicians, photgraphic laboratories, etc.) for all the researchers of the University. In the past the School of Engineering offered to do certain work for researchers on a first come, first serve, basis. As our faculty increase their research efforts, it becomes clear that we can no longer provide service on any reasonable basis for the rest of the campus. By the end of the coming academic year our technicians will be fully occupied (and likely lagging) with research needs of the School. Only one reasonable solution exists for the problem in my opinion and that is to seek ways of charging grants and contracts as well as department accounts for services provided by a central research service operation. In this way funds can be made available to hire additional, and in some cases, more specialized personnel so that service can keep up with demand. There is a real danger that if the University does not provide such service that private enterprise will -- to the inconvenience and unhappiness of the faculty.

The School of Engineering stands ready through the Engineering Research Institute to offer such services and to add the necessary crafts and capabilities if a system of charges for services rendered can be developed. It should be mentioned that efforts are being made by several people at the University to institute such services.

6. One of the most difficult problems we face in the School of Engineering is that of upgrading capable, dedicated and productive non-professional personnel. As we understand the system it is nearly impossible to reward capable and loyal employees in the School. Rather they must leave the job they are doing well to attain promotion. This system destroys developing a group with real "esprit de corps" and encourages "job hopping" for promotion. The Governor's office apparently recognizes the problem but hopefully we can do something at the local level to encourage promotions in a given job for work well done. We cannot let job descriptions. job titles, and other civil service red tape stand in the way of promotions for loyal and hardworking employees.

7. Real problems will develop with the changes that are underway in the School of Engineering but they are problems we must solve ourselves. New undergraduate curricula offerings will require much time and effort of all our faculty members. At the same time we must begin study of the Interim Report of the Committee on Goals of Engineering Education of the American Society for Engineering Education. If the recommendations of the "Goals Committee" obtain the approval of the Engineers' Council for Professional Development we may find ourselves in a position of going to a five year engineering program in the next 3-5 years if we hope to maintain accreditation. The future of the report's recommendations is still very much in doubt and subject to hot debate through-out the land. The Engineering School Curriculum Committee, chaired by Associate Dean Lindsey, will study the Interim Report early next year and make recommendations to the Executive Council of the School for action.

VII Acknowledgements

This report started with an expression of gratitude to all who helped make possible the progress of the past year. It should end on the same note. The administration has provided excellent support to the School which should be acknowledged.

Perhaps of great significance, however, is the support the writer feels he has had from department heads, faculty members, technicians and secretaries, without which nothing could have occurred. This support is indeed gratefully and sincerely acknowledged.

Respectfully submitted,

K. G. Picha, Dean
School of Engineering

APPENDIX I

APPROPRIATION DATA

1. Total Appropriation, School of Engineering

		1964-65	1965-66	1966-67
01	Salaries, Permanent	$665,622.	$775,343.	$907,307.
02	Salaries, Other	30,017.	58,669.	79,362.
03	Services, Non-Empl.	26,100.	22,800.	31,500.
04	Food	100.	100.	100.
10	Travel & Automotive Exp.	4,550.	7,250.	8,000.
11	Advert. & Print.	250.	250.	800.
12	Maint., Repairs, Alts.&Repl.	8,400.	8,400.	10,500.
13	Special Supplies	22,500.	20,500.	24,000.
14	Office & Admin. Exp.	2,000.	2,700.	2,000.
14-1	Telephone	4,400.	4,400.	7,000.
15	Equipment	32,000.	35,000.	59,650.
15-1				11,150.*
16	Rentals	1,500.	4,200.	8,000.

* Matching for U. S. Office of Education equipment grant.

APPENDIX II

PERSONNEL & ORGANIZATION CHART

1. The following table lists the total personnel (full time equivalent) in the School of Engineering as of September, 1967:

	1964	1965	1966
Deans	2	2	2
Department Heads	4	5	5
Professors	11.5	15	22
Associate Professors	18.5	18	24.5
Assistant Professors	15	17	18.5
Instructors	3	2	2
Lecturers	1	1	1

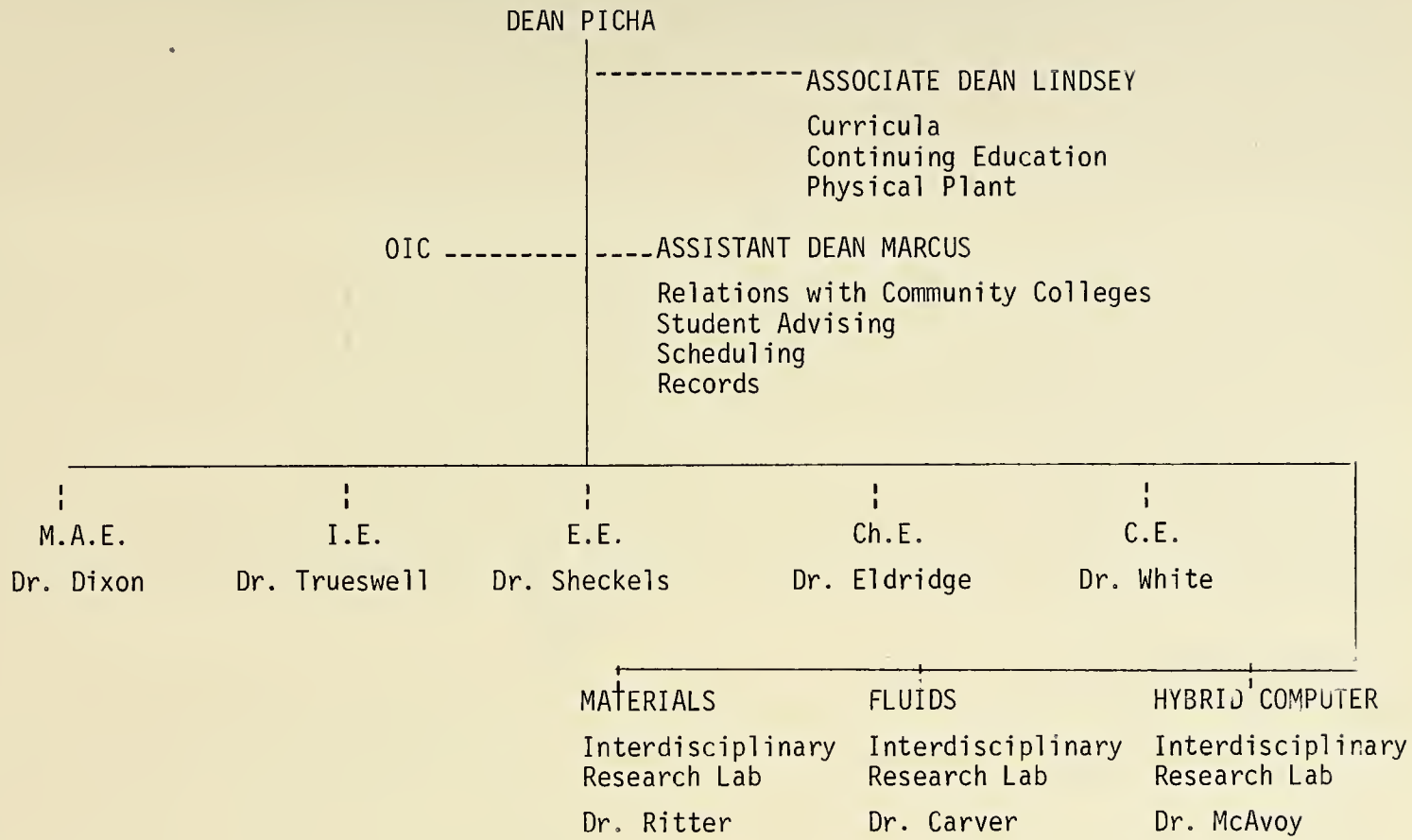
The following represents the breakdown by rank in each of the five departments (excluding Deans):

	Ch.E.			C. E.			E. E.			I. E.			M. E.			Basic		
	64	65	66	64	65	66	64	65	66	64*	65	66	64	65	66	64	65	66
Professors (Incl. Heads)	2	2	3	6	6	7	3	3	3	-	0	0	4	4	6			
Associate Professors	2	2	3	4	5	5	5	7	7	-	1.5	2.5	5	5	5	1.5	1.5	1.5
Assistant Professors	2	2	2	5	6	4	4	4	4	-	1	2	1	3	4	3	3	3
Instructers	-	-	-	0	0	0	-	-	-	-	1	1	0	0	0	1	1	1
Lecturer	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* I.E. option in Mechanical Engineering in 1964

ORGANIZATION CHART

SCHOOL OF ENGINEERING



Room	Name	Ext.
Rm 125	Dean's Office	[illegible]
Rm 125	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]

APPENDIX III

STUDENTS SERVED

STUDENT DATA

I STUDENTS SERVED

	Fall '64	Fall '65	Fall '66
1. Engineering School Totals			
(a) (i) Number of Undergraduate Majors	900	894	961
(ii) Number of Graduate Students	107	125	157
(b) Number of students taught	3142	2430	3078
2. Chemical Engineering			
(a) (i) Number of Undergraduate Majors	63	78	84
(ii) Number of Graduate Students		38	46
(b) Number of students taught	210	229	159
3. Civil Engineering			
(a) (i) Number of Undergraduate Majors	105	139	167
(ii) Number of Graduate Students	19	34	46
(b) Number of students taught	804	729	753
4. Electrical Engineering			
(a) (i) Number of Undergraduate Majors	186	159	169
(ii) Number of Graduate Students	14	18	21
(b) Number of students taught	282	289	765
5. Industrial Engineering			
(a) (i) Number of Undergraduate Majors	53	47	54
(ii) Number of Graduate Students	16	10	20
(b) Number of students taught		84	95
6. Mechanical & Aerospace Engineering			
(a) (i) Number of Undergraduate Majors	150	148	160
(ii) Number of Graduate Students	16	10	24
(b) Number of students taught			794
7. Undesignated Engineering Basic and Unassigned			
(a) Number of Undergraduate Majors	303	275	295

Number of Degrees Granted	Sept. '64 to June '65	Sept. '65 to June '66	Sept. '66 to June '67
Bachelor of Science	150	132	121
Master of Science	14	35	46
1. Chemical Engineering			
B.S.	18	20	12
M.S.	4	10	10
2. Civil Engineering			
B.S.	28	37	33
M.S.	2	4	12
3. Electrical Engineering			
B.S.	47	34	33
M.S.	4	3	11
4. Industrial Engineering			
B.S.	14	11	14
M.S.	1	8	5
5. Mechanical and Aerospace Engineering			
B.S.	43	30	29
M.S.	3	10	8

APPENDIX IV

PROFESSIONAL ACTIVITIES OF THE FACULTY

Faculty Publications

(i) Chemical Engineering

Lenz, R. W.
Author of "Organic Chemistry of Synthetic High Polymers", Interscience Publishers, New York, March, 1967 (837 pages)

Editor of "Polymer Preprints", Vol. 8, No. 1, American Chemical Society, April, 1967 (855 papers)

McAvoy, T. J. and Johnson, E. F.
"Computing the Transient Response of Dead-Time Control Sytems", Ind. & Eng. Chem., Process Design and Development, Vol. 5, No. 4, pp. 440-2, October, 1966

Novak, R. J.
Book Review: "Fundamental Analogue Techniques" by R. J. A. Paul in Mechanical Engineerng News, February, 1967

Roblee, Lee H. S.
"Method of Operating a Fuel Cell Containing a Sulfuric-Nitric Acid Electrolyte", U.S. Patent 3,261,716, July 19, 1966

(ii) Civil Engineering

Five publications in Journals or Proceedings of National Meetings

(iii) Electrical Engineering

Maunder, Sydney T.
"Jet-Turbine Experience Surpasses Expectations", Electric Light and Power, Vol. 40, No. 9, pp. 55-57, Sept.,1966

Monopoli, Richard V.
"Control of Time Variable, Nonlinear, Multivariable Systems Using Liapunov's Direct Method", with D. P. Lindorff. Preprints of 1966 Joint Automatic Control Conference, pp. 475-484, 8 figs., August, 1966

Monopoli, Richard V.
"Control of Linear Plants with Zeros and Slowly Varying Parameters", IEEE Transactions on Automatic Control, Vol. AC-12, No. 1, pp. 80-83, 5 figs., February, 1967

Scott, Donald E.
"Computer Design of Chebyshev Filters", Electro-Technology, Vol. 78, No. 5, pp. 111-112, November, 1966

(iv) Industrial Engineering

Trueswell, Richard W.
"Information Searching Behavior of Physicians", presented at the National Meeting of the Operations Research Society of America, October 16-18, 1966, Durham, North Carolina

James, Charles F.
James, Richman and Stanislao, "Titanium Carbide Cutting Tools", ASTME Journal, July, 1966

"A Design of a Test System to Aid in Cutting Tool Selection", paper presented at the 1967 ASTME Annual Engineering Conference, April 24-28, 1967 in Chicago, Illinois

Rising, Edward J.
Rising, Edward J. and Millen, Roger N., "Work Sampling in a Hospital Rehabilitation Unit", Proceedings of the Seventeenth Annual Institute Conference and Convention, American Institute of Industrial Engineers, pp. 176-182

Kaminsky, Frank C.
"An Application of Regenerative Stochastic Processes to a Problem in Inventory Control", published in Operations Research, May-June, 1967

Millen, Roger N.
Rising, Edward J. and Millen, Roger N., "Work Sampling in a Hospital Rehabilitation Unit", proceedings of the Seventeenth Annual Institute Conference and Convention, American Institute of Industrial Engineers, pp. 176-182

(v) Mechanical and Aerospace Engineering

Murthy, S.N.B.
"Optimization of Three-dimensional Nozzle Flows", Journal of Spacecraft and Rockets", Sept. - Oct., 1966 (with H. D. Thompson)

Review of "Basic Developments in Fluid Dynamics", Mechanical Engineering News, Vol. 4, No. 1

Zinsmeister, G. E.
Review of "Basic Radiation Heat Transfer", E. M. Sparrow & R. D. Cess, Brooks/Cole 1966, Mechanical Engineering News, Vol. 4, No. 2, May, 1967

Ritter, J. E.
"Adherence and Wettability of Nickel, Nickel - Titaniam Alloys, and Nickel Chromium Alloys to Sapphire", Trans. Met. Soc. AIME, 239, 21-26 (1967)

Dixon, John R.
"Design Engineering" (Book), McGraw-Hill, 1966

Fillo, J. A.
"Approximate Solution to the Flat Plate Thermometer Problem" AIAA,Oct.,1966
"Heat Transfer from a Flat Plate in Wagnetobydrodynamics, Phys, Fluids, 11-'66

II Papers Presented

(i) Dean's Office

K. G. Picha, "Effects of Technological Change and Innovation on the Educational Process", presented at Engineering Research Conference, Andover, N. H., July, 1966

K. G. Picha, "Progress Report -- School of Engineering",to Western Massachusetts ASME Section, Spring, 1967

K. G. Picha, "Progress Report -- School of Engineering", to Amherst Rotary Club, Fall 1966.

(ii) Chemical Engineering

R. W. Lenz, seminar at Esso Research and Engineering Company, Baytown, Texas, January 13, 1967, "Reaction-induced Crystallization of Poly (ester-Acetals)"

R. W. Lenz, talk to the Chicago Section of the American Chemical Society, Polymer Group, March 17, 1967, "Reaction-induced Crystallization of Poly (ester-Acetals)"

R. W. Lenz, talk to the Northern New Jersey Section of the American Chemical Society, Polymer Group, March 27, 1967, "Reaction-induced Crystallization of Poly (ester-Acetals)"

R. W. Lenz, seminar at Stauffer Chemical Company, Eastern Research Laboratory, Dobbs Ferry, New York, April 21, 1967, "Reaction-induced Crystallization of Poly (ester-Acetals)"

R. W. Lenz, Session Chairman, Polymer Division General Papers, National Meeting of the American Chemical Society, New York, September 12, 1966

(iii) Electrical Engineering

Sydney T. Maunder, "Thirty Months' Experience with the Holyoke Jet Turbine", American Public Power Association, March 15, Houston, Texas.

Charles E. Hutchinson, "Modern Control Systems", Springfield Section, IEEE, January 17, 1967, Springfield, Massachusetts

Charles E. Hutchinson, "Practical Uses of Kalman Filtering in Inertial Navigation Systems", April 24th, Rensselaer Polytechnic Institute, Troy, N.Y.

(iv) Mechanical and Aerospace Engineering

R. J. Glass, "Amplitude and Frequency Response and Laws of Similitude for Vortex-Induced Vibrations of Spring-Supported Cylinders in Subcritical Flows", First Canadian Congress of Applied Mechanics, May, 1967

John R. Dixon, "An Engineering View of Biological Freezing" Symposium of the Interaction Between Engineering and Biology, University of Mass.,May, 1967.

III Research Grants

(i) K. G. Picha and C. E. Carver, "Project Themis Support of Research on Deep-Sea Submersibles", $663,000. for three years (approx. figure)

(ii) Chemical Engineering

T. J. McAvoy, National Science Foundation, " Research Initiation - A New Approach to Solving Partial Differential Equations on an Analog Computer", GK 1562, $10,000., March 31, 1967

T. J. McAvoy and R. J. Novak, National Science Foundation, "Purchase of Hybrid Computer Components", GK 1403, $45,000., January 23, 1967

Lee H. S. Roblee, National Science Foundation, "An Infrared Spectroscopic Investigation of Carbon Formation in Flames", GK 1209, $11,200. August 11, 1966

J. W. Eldridge,
(a) Monsanto Chemical Unrestricted gift - $1,000.
(b) Esso Company - Unrestricted gift - $1,000.
(c) DuPont de Nemours Company, Summer Research Grant - $2,200.

(iii) Civil Engineering

Stanley M. Bemben, "The Influence of Lateral Restraints Upon the Compressibility Behavior of a Sand", UMass. Faculty Research Grant FR-M13-67(1), $720.

Charles E. Carver, "Experimental Investigation of Non-Newtonian Flows at Low Reynolds Numbers", U.S. Navy Nonr 3357(07), $11,239.

Alexander Chajes, "Inelastic Beam Deflections", UMass, Faculty Research Grant FR-M-13-66(1), $365.

Tsuan H. Feng, "Water Quality and Water Quantity", Federal Water Pollution Control Administration 5T1-WP-77-02, $31,000.

Tsuan H. Feng, "Water Quality Flow-Augmentation of the Connecticut River Basin", Federal Water Pollution 14-12-7, $8,800.

Tsuan H. Feng, "Effects of Organic Deposits on Water Quality in Impoundments", Water Resources Research Center WR-11, $5,400.

Denton B. Harris, "The Mechanics of Fluid Transport in Vegetation", Water Resources Research Center WR-17, $12,400.

Karl N. Hendrickson, "Small Watershed Storage Increase Using Low Dams", Water Resources Research Center WR-16, $6,000.

George R. Higgins, "Hydrological Studies in Massachusetts", Water Resources Research Center WR-3, $4,000.

George R. Higgins, "Evaporation Studies in Massachusetts", UMass, Faculty Research Grant TR-M13-65(5), $300.

Melton M. Miller, " The Behavior of Hyperbolic Paraboloid Thin Shells", National Science Foundation GK-1573, $9,800.

Merit P. White, "Influence of Mobility of a Ship on Internal Reactions Produced by Blast", U. S. Navy N600(167)65486(X)FBM, $19,000.

(iv) Electrical Engineering

C. E. Hutchinson, "Optimum Estimation of System States", National Science Foundation Grant GK-810, $17,800. from June, 1966 to June, 1968, Professor Hutchinson, Principal Investigator, support for one graduate student

R. V. Monopoli, "Optimum Control System Design", National Science Foundation Grant GK-817, $9,300. from September, 1966 to September, 1967, support for one graduate student

Professors R. V. Monopoli and C. E. Hutchinson, "Pulse Frequency Modulated Control Systems", National Aeronautics and Space Administration Grant NGR-22-010-018, $12,000., from September 1966 to September 1967, support for two graduate students

Richard V. Monopoli, "Control and Estimation in Systems with Unknown Parameter Variations", National Aeronautics and Space Administration Grant NGR 22-010-012, $27,558., awarded May 22, 1967, to run from September, 1967 to August 1968, support for three graduate students

(v) Industrial Engineering

Video-tape Recording System, Gift from General Electric Foundation valued at $2,000.

(vi) Mechanical and Aerospace Engineering

John R. Dixon, $5,000. unrestricted grant from General Electric Foundation

John R. Dixon, $1,000. Summer Research Award from Olin Mathison

John Dittfach, $24,900, "Undergraduate Scientific Equipment", NSF, May 1, 1967 to May 1, 1968

G. E. Zinsmeister, $19,900, "Research Initiation - Coupled Conduction and Convection" - NSF - July 1, 1967 to June 30, 1969

J. A. Fillo, $17,430., "Development of a Moment Method to Solve the Three-Dimensional Boundary Layer Equations - NASA - July 1, 1967 to June 30, 1969

John R. Dixon, $3940., "Undergraduate Research Participation" - NSF, Summer 1967

(i) Chemical Engineering

Sponsored Research Only, Grants and Contracts in Progress:

E. E. Lindsey and D. C. Chappelear, National Science Foundation, "Deformation and Non-Newtonian Behavior in Suspensions", GK 1110, $25,300. May 27, 1966 (2 yrs.)

Lee H. S. Roblee, Office of Naval Research, "Dropwise Condensation of Steam", NONR 3357 (02), $26,733., June 1, 1966 to May 31, 1968

In addition, research proposals to various federal agencies were prepared and submitted this year by Dr. Eldridge, Kirk, Lenz, and Roblee, and it is expected that several of these will result in research grants. Also, Dr. McAvoy and Professor Novak submitted a major equipment proposal as part of the Hybrid Computer Center proposal

(ii) Civil Engineering

Robert Archer, "Vibration of Spherical Shells Including Transverse Normal Stress Effects"

Robert Archer, "Non-linear Wave Propagation in Beams and Shells"

Stanley M. Bemben, "The Influence of Filter Paper Strips Used for Lateral Drainage Upon Measured Strength of a Soft Clay"

William Boyer, "A Study of the Effect of Regulatory and Maintenance Signs on Vehicular Speeds"

Alexander Chajes, "Non-linear Plate Buckling by Finite Elements"

Alexander Chajes, "Post-buckling Behavior of Columns that Twist and Bend Simultaneously"

Alexander Chajes, "Orthogonality Conditions for Complex Dynamic Systems"

Frederick Dzialo, "Impact Loading of Elastically Connected Thin Plates"

Frederick Dzialo, "Flexural Vibration of Aeolotropic Plates on an Elastic Foundation"

Tsuan Feng, "Dilution Effect on BOD Determination"

Tsuan Feng, "Aerobic Digestion of Primary Sewage Sludge"

Tsuan Feng, "Disinfection by Bromine"

Karl Hendrickson, "Engineering Properties of Glacial Lake Hadley Clays"

Karl Hendrickson, "An Investigation of Distress in a Highway Grade Separation Due to Movements in Varved Clay

Karl Hendrickson, "Glacial Strand Lines in Lake Hadley"

Karl Hendrickson, "Recent History of Meanders of the Connecticut River from Sunderland to Smith's Ferry"

Melton Miller, "The Formulation of Working Load Specifications for Reinforced Concrete Columns Controlled by Tensile Strength

Frederick Stockton, "Prepared Program to Compute Rainfall on Watersheds"

(iii)Electrical Engineering

Sponsored Research primarily

(iv) Industrial Engineering

C. F. James, "Study of Traffic Characteristics and Traffic Violations"

F. C. Kaminsky, Co-Principal Investigator, "Spoke Design Hospital Project"

R. F. Rikkers, "Mathematical Models for Inventory Control Systems"

E. J. Rising, Co-Principal Investigator, "Spoke Design Hospital Project"

R. W. Trueswell, "Library Systems Analysis and Research Project Selection Studies"

(v) Mechanical and Aerospace Engineering

S.N.B. Murthy, "Curved Flows- Supersonic; Electro-magnetically Active"

" " " " "Actuator Disk in Porous Duct"

" " " " "Stability of Compound Streams"

G. E. Zinsmeister, "Inverse Conduction Problems - Development of an Explicit Numerical Technique for Inverse Heat Conduction Problems

G. E. Zinsmeister, "Extension of Monte Carlo Techniques to Convection Problems"

R. W. Day, " Supersonic Flow in Curved Passages

J. E. Ritter, "Dynamic Fatigue of Etched Glass"

J. E. Ritter, " Zone Refining of Organic Compounds"

M. E. Bates, "Automatic Blackboard Eraser, Design and Development"

" " " "Determination of the Coefficient of Permeability of Porous Sintered Bearings"

" " " "A Study of Optimum Design Variants for Mitigating Stress Concentrations"

" " " "Design and Development of a Miniature Simulator for Stress Analysis and Flow Study"

R. J. Glass, "Damping of Bodies Vibrating in Fluids"

" " " "Response of an Oscillator Inside a Shell to a Shock Wave in the Surrounding Fluid"

" " " "Response of Nonlinear Coupled Oscillators"

" " " "Vortex-Induced Vibrations of a Cylinder"

John R. Dixon, "Optimization of Thermal Processing of Foods"

" " " "Experimental Studies in Electro-kinetic Energy Conversion"

J. A. Fillo, "MHD Heat Transfer - Manuscript prepared for publication

" " " "MHD Heat Transfer - Manuscript being prepared for submission to ASME Conference

" " " "Curved Duct Flows" - Abstract prepared with Dr. Murthy as principal investigator for a conference to be held in Huntsville, Alabama, November, 1967

V. Consulting and other Professional Activities

(i) Dean's Office

K. G. Picha; Consultant NSF Division of Institutional Programs, made site visits on University Science Development, Departmental Development and Facilities proposals.

ECPD Evaluation Visits
Chairman ASEE Subcommittee on Relations with the Office of Education
ASEE Subcommittee on Relations with the NSF
ASEE Committee on Relations with Federal Government
ASEE Curtis McGraw Research Award Committee
Governor's Committee on Traffic Safety

E. E. Lindsey;

Engineering Research Council Committee on Research and Graduate Studies
AIChE Equipment Test Procedures Committee
Massachusetts Society of Professional Engineers
Student Professional Development Committee

H. D. Segool;

Dr. Segool is a member of the Governor's Advisory Committee on Science and Technology. He is National Chairman, TASK FORCE/ REGIONAL PROGRAMS, Office of State Technical Services, U. S. Department of Commerce. He initiates and maintains contact with individual industrial, State, and Federal facilities with which the University can identify and implement related interests in its educational, research, or service commitments. One such activity has been the developmental initiation of a work-study program in undergraduate engineering education in cooperation with industry.

Thus, COMTECH has become a significant manifestation of the outward reach of the University to the industrial, business, and commercial environments of the Commonwealth. At this time, the ability of COMTECH to carry out the service opportunity represented by the State Technical Services Act hinges extensively on the obtainment of appropriate State funding. Very

few, possibly a half-dozen, other states in the Nation have failed to partake of this opportunity to technologically update their industrial base, or to catalyze the introduction of technologically-based growth industries thru the extension activities supported by the STSA. Interstate and inter-regional industrial and economic competition will be heightened by successful STSA-Sponsored programs. Funding, manning, and project implementation thus become timely problems for COMTECH if it's to carry out its STSA assignment.

J. S. Marcus;

Chairman of Committee working with New England Universities establish a cooperative program with AEC (Principal Investigator on AEC contract to finance Committee study).

(ii) Chemical Engineering

K. D. Cashin

AICHE Measurements Committee

ASEE Energy Conversion Committee

J. W. Eldridge

AICHE Professional Development Committee

Directory, Western Massachusetts Section of AICHE

R. W. Lenz

Chairman, Publications Committee, Polymer Division, American Chemical Society

Member of Executive Program and Membership Committees, Polymer Division, American Chemical Society

Member of Organizing Committee, "Symposium on Spinning and Drawing of Fibers", National Meeting of the American Chemical Society, New York, September, 1966

Consultant to Fabric Research Laboratories, Dedham, Mass. (11 visits) and Esso Research and Engineering Company, Baytown, Texas (3 visits)

T. J. McAvoy - Paper Reviews

1. For AIChE Journal, March, 1967, "Nonlinear Feed Forward Control of Chemical Reactors"

2. For AIChE Journal, April, 1967, "The Synthesis of System Designs I. Problem Decomposition Theory"

(iii) Civil Engineering

Charles E. Carver, Control Member, Fluid Dynamics Committee, EMD, ASCE

Karl Hendrickson, Member, Geological Society of America

Merit P. White, Member, Committee on Mechanical Properties of Materials, ASCE

Member, Committee on Civil Defense National Academy of Sciences

Member, Ad Hoc Committee on Dynamic Shock Analysis, U.S.Navy

Stanley M. Bemben, Program Chairman, Western Mass. Branch of American Society of Civil Engineers

Charles E. Carver, Chairman, Task Committee on Non-newtonian Flows, Engineering Mechanics Division, ASCE

Secretary, Sub-committee on Oceanographic Engineering, ASEE

Thomas A. Grow, President, Western Mass. Branch of American Society of Civil Engineers

Merit P. White, Vice-Chairman, Committee on Engineering Education, ASCE

William W. Boyer, Presented a paper, "The Place of the Contact Member in Student Chapter Affairs", at ASCE Student Chapter Advisors Conference in Boston

Alexander Chajes, Presented Seminar at David Taylor Model Basin, April, 1967

Tsuan H. Feng, "Effects of Organic Deposits on Water Quality in Impoundments", presented at the Symposium on Water Resources Research, June 2, 1967. Co-author: Henry C. Hyde, Jr.

(iv) Electrical Engineering

C. E. Hutchinson, Member of National Board of Directors for Eta Kappa Nu

Intermittent consulting for Laboratory for Electronics, Boston, and for Analytical Sciences Corporation, Winchester

R. V. Monopoli and C. E. Hutchinson, Part of advisory group to appraise methods, accomplishments, and plant of Army Electronics Command, Fort Monmouth, New Jersey, March 6-9, 1967

G. D. Sheckels, Chairman, Springfield Section, Institute of Electrical and Electronic Engineers

Chairman, Finance Committee for Town of Amherst

Member, Editorial Committee, American Society for Engineering Ed

Intermittent consulting for Holyoke Water Power Company, Holyoke

(v) Industrial Engineering

C. F. James, Consultant for Acme Cotton Products Company

E. J. Rising, Consultant for Educational Testing Service

R. W. Trueswell, National representative of the American Institute of Industrial Engineering to JETS organization and to Committee on Development of Young Engineers of ECPD

President of Springfield Chapter of the American Institute of Industrial Engineering

(vi) Mechanical and Aerospace Engineering

J. M. O'Byrne, NASA-ASEE Summer Faculty Fellow - Marshall Space Flight Center, Huntsville, Alabama, Summer, 1966 and 1967

"Cryogenic Propellant Storage for Space Vehicles" Marshall Space Flight Center, Huntsville, Alabama, Oct. 1966

R. E. Day, Sigma Xi Admissions and Program Committee

J. H. Dittfach, Society of Automatic Engineers, Annual Meeting, January, 1967. Served last year of a three year term as member of National Sections Committee. Served as paper review on this committee.

American Society for Engineering Education, New England Section, arranged and served as Chairman for discussion group on Credit Hour Load Reduction at Fall, 1966, Meeting.

S.N.B. Murthy, Project SQUID Annual Meeting, March, 1967
International Conference on Subsonic Aerodynamics of the New York Academy of Sciences, April, 1967.

J. R. Dixon, Discussion Resource Person - "Reduction of Credit Hours" ASEE Regional Meetings, New Haven, October, 1966.

Talk to Regional Meeting Society of Industrial Engineers on "Programmed Instruction", December, 1966.

Member ASME Technical Committee K-17-Heat Tx in Bio-Technology

Chairman - ASME Committee on Thermodynamics, Energetics Division

Talk to ASEE Meeting on Improvement of Teaching; "Dimensions of Effective Teaching", May, 1967

M. E. Bates, ECPD Student Development Committee Member

APPENDIX V

ENGINEERING DEPARTMENT LONG RANGE PLANNING

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From Basic Engineering Dept. Date January 17, 1967

To Dean Picha

Subject Long-Range Plan (January, 1967)

If pre-professional engineering education is viewed closely, all the potential ingredients necessary for a revolution can be observed, but they are diffused and as yet unorganized. The need for organization and direction for pre-professional study is locally urgent and nationally recognized but not yet fully appreciated. The freshman year is a problem every place; substantial federal (or foundation) funds have been more or less systematically channeled in other directions leaving a void in the pre-professional field; individuals of imagination and skill have been attracted to the frontiers of professional studies and the pre-professional field has apparently been left to the "second string."

Only two additional ingredients are needed to bring this potential revolution to fruition--strong determined leadership, and substantial funds.

It is not as if the directions we must eventually take were not clear enough. It is beginning to happen already here in Massachusetts, as it has happened in California. We see an ever growing number of students doing a substantial part of their pre-professional work in community and junior colleges. Whatever our feelings about these numbers, and however we may feel about the adequacy of the preparation of these students, we still need to accept the basic fact and adjust to it.

On top of this trend of fact is the trend of opinion. The much maligned "Preliminary Goals Report" clearly directs our attention to the upper end of the curriculum with its focus on the integrated five year masters program. Little is said about pre-professional engineering education, but when taken with ambiguous references to a four year program for students unable and/or unwilling to continue for five years, a practical outline seems to emerge. Perhaps this outline is suggested as much by what is not said as from what is said. As the preoccupation of departments continues to be toward the graduate study and research required by a five year integrated masters program, the pre-professional studies are going to have reorganized in some deliberate way or quality will be lost by default.

To me this developing picture argues for a strong and somewhat separated pre-professional program through the first two years, at the end of which the best students matriculate into various departments. This matriculation should ideally be openly competitive for students from UMass/Amherst, UMass/Boston, and the community and junior colleges across the state. The choice of the students who are permitted to matriculate should be based, as far as possible, on objective criteria possibly including written examinations. The criteria should be set by the departments involved in consultation so that they will maintain reasonably uniform standards. If standards were set so that perhaps 80 to 90 percent of our students, and upwards of 50 to 60 percent community college transfers qualified, not only would it maintain reasonable enrollments in the various departments, but it would give a positive control of minimum standards. These standards could be raised

as appropriate to enrollment pressures and increasing quality of the higher division programs.

In addition, an option needs to be provided for those who do not qualify. Naturally, withdrawal and transfer to other schools and colleges within and without the University would be the route many would follow. However, a Bachelor of Science in Engineering, or Industrial Technology (or some euphamism for consolation prize) could be devised as an outlet for leftovers and a second chance for "late bloomers". Naturally, a certain fluidity would have to be retained, but this could be controlled with reasonable ease.

In the longrun pressures will force something of this kind. I feel that it will probably happen within the next ten years, and it should be reflected in the planning of the Basic Engineering Department. It is not included because we do not know how to include it at this time.

The attached Long-Range Plan is clearly too realistic. Our plans are constrained too much by the recognition of the present pressing growth needs of others (and perhaps we have too much acceptance of their priorities). This memo, not a part of our Long-Range Plan, is only to make the point that our goals are beyond those we feel it timely to state, and our thinking has in some degree gone beyond the necessities of the moment.

Sincerely,

Edward J. Rising
Acting Head
Basic Engineering

BASIC ENGINEERING
Long - Range Plan

"Would you tell me, please, which way I ought to go from here?"
"That depends a good deal on where you want to get to," said the Cat.
"I don't much care where---" said Alice.
"Then it doesn't matter which way you go," said the Cat.
"_____so long as I get somewhere," Alice added as an explanation.

ALICE'S ADVENTURES IN WONDERLAND
Lewis Carroll

The feeling that Alice has is understandable to all, particularly those of us in Engineering Education today, observing that our profession has acted like Alice is hardly a revelation.

Perhaps some of the difficulty is that most current discussion of engineering education, and "long-range plans" most notably the "Preliminary Goals Report", have been concerned primarily with <u>means</u> to accomplish, not <u>ends</u> to accomplish. It appears to me it is necessary for our profession to do more fundamental thinking about what we hope to accomplish by our machinations before problems of how we should proceed are examined in any considerable depth.

This long-range plan, like so many others, will suffer from the same malady as many of the plans created in the past, and for many of the same reasons. To the extent it can lift its sights it is likely to be criticized for vagueness; to the extent it deals with present reality it becomes self limiting.

It seems that this effort should follow, not precede the consideration of our overall program, and further, that consideration of our overall program should follow, not precede a carefully reached conclusion of where the University of Massachusetts School of Engineering stands relative to the engineering profession. Most urgently, however, we need a clear view

of the current forces in education and how we preceive the relationships between our profession and Society.

Of course, this is a great deal to ask before beginning a long range planning effort, but it also may be the irreducable minimum. The ray of hope to which we cling is that the thought and planning done on all these levels can be concurrent (provided communication is maintained) and that this plan may be treated as transitory.

EDUCATIONAL PHILOSOPHY

The objectives for the freshman year are developed from the fact that the freshman year in an engineering program represents a bridge between the high school on one hand and the professional education in engineering on the other. There are only introductory aspects of engineering taught during the freshman year; the earlier portion of the curriculum being devoted primarily to fundamental math and sciences. In a modern engineering curriculum the engineering studies usually begin in the sophomore year, build up during the junior year, and are studied in some depth during the senior year. The transition between high school on the one hand and engineering studies on the other requires not only a carefully thought out program, but a dedicated and capable staff.

It is from this point of view that three fundamental types of objectives for the freshman year can be developed:

1. Entering students must first be taught the tools that he needs to learn the engineering that is presented to him in the portion of his program devoted to his engineering, which occurs in the latter years. For the freshman these tools are primarily the languages of engineering, which are English, graphics, mathematics, and computer language. In addition to the rudiments of English composition, the student must be taught to exchange ideas on technical as well as general subjects.

2. The student must adjust to the academic community. This would include the mature choice of a major area of study as well as a somewhat larger view of the world around him. Most students need considerable help with one or more aspects of this overall adjustment.

3. In addition to the above, the freshman year includes certain content objectives. These objectives may very well be the means by which much of the former two objectives may be accomplished; for example, problems relating to the various engineering disciplines can be used not only to teach problem solving techniques and the application of mathematics to human problems, but also give the student a feel for some of the various kinds of problems that are met in different engineering fields. This kind of knowledge would help him to a mature choice of "Major".

The Basic Engineering program centers on the freshman student, and our program will are to take into account the nature of student body as we find it, not as we wish it was. On he positive side, the freshman student body at the University of Massachusetts is reasonably trong intellectually. Our students are comparable, on the average, to most schools of engineering across the country and are somewhat better than the average of the state universities. ndeed, our students are stronger than the overall average of the male students entering the niversity of Massachusetts.

On the negative side, our students tend to be provincial, 95 percent come from Massachusetts. Experience has shown that little over half of the students have ever been out of ew England in their lives, and close to 25 percent have never been outside of the state of assachusetts by the time they reach college age. Also, our student body lacks the leavening gent of a small proportion of highly capable students that are apparently drained off by ore prestigous institutions. For example, we have no National Merit Scholars, etc. Our udents come from predominantly middle class homes and the bulk of them view engineering rimarily as a career that will give them upward social mobility.

Perhaps the most striking thing about our entering students is their homogeneity.

It is in these circumstances that Basic Engineering must make its primary contribution, hich is teaching two of the languages of engineering (graphics and computation skills), and elping the freshmen make their adjustment to their professional education (through advising). his <u>nature</u> of our work will not change, but we hope the <u>quality</u> of the work as well as the mpact it has on the student will constantly improve.

GOALS

We are unable to set the following goals that we hope to accomplish. Meeting these goals ll be a constant challenge and will absorb the bulk of our efforts. In connection with both advising and teaching program particular goals can be identified.

The advising program for the freshmen needs to be improved.

1. Each entering freshman engineering student should be helped to an appropriate schedule compatible with his own ability and objectives.

2. By the end of the freshman year each entering engineering student should be able to choose his major department in a thoughtful and careful way based on sound information.

3. By the time each engineering student is ready to enter his degree program in the sophomore year, he should be able to discuss problems of general and technical interest. This ability to discuss problems implies that the student should be able to thoughtfully read material on both engineering and social problems, reach reasonable conclusions, and discuss these conclusions in a give and take fashion as is presently done only in Honors Colloquia.

4. Each engineering freshman student should know his advisor well enough to turn to him for help if he needs it. This implies that there is personal relationship between student and advisor, and an understanding on the part of the student that his advisor stands ready to support and help him with problems both academic and personal.

By and large it is the objective of the advising program in Basic Engineering to be responsive to the individual needs of the student, and help him make a reasonable adjustment o college. There are many facets of this adjustment which include not only living away rom home in a new physical environment, but living and working in a productive way in n intellectual environment that is new to many of our students.

We take pride in what we feel is a high level of excellence in the teaching aspects of ur program, however, there are always possibilities to improve and add excitement. In ddition, we recognize certain aspects of the situation need to be examined closely now, ecause in the future we will need to be ready to change to meet the needs that will be current t that time.

1. A higher awareness and enthusiasm for professional growth needs to be developed. The leadership and staff needs to become active pursuing topics such as computer graphics, additional computer languages, numerical methods, psychology and counseling, research methodology, as well as graphic science itself. This pursuit should include seminars, auditing and enrolling in courses, and personal research and study. A thrust toward the goal of being able to respond to future needs and changing patterns in engineering education is our present most important goal.

2. The administration and leadership of Basic Engineering needs to be carefully considered for the "long pull". While there are certain short-run advantages to the present situation for all concerned, it is apparent to me that the administrative structure is not conducive to longrun stability and the growth of programs that are needed if it is to continue to be viable. The present leadership suffers from lack of a present (or past) academic specialty in the disciplines taught, as well as being spread thinly over teaching and research responsibilities that, while they hopefully contribute to the School of Engineering, do not add to the Basic Engineering program.

3. A vertical series of courses in subject matter areas taught by Basic Engineering must be devised so that opportunity is available to develop and teach advanced subject matter. This is the only reasonable way that subject matter can be organized so it filters down to upgrade and improve elementary courses. If this is not possible within the Department, exchange arrangements will need to be worked out so this effect can be achieved.

4. The breadth of offerings will need careful thought. It is not our desire to diffuse our efforts, and certainly we do not intend to spend our limited resources encroaching in subject matter best left to others, but ample opportunity needs to be provided for our staff to fully utilize their talent both for the benefit of the School and the professional development of the staff members concerned. It may be that the administrative techniques to accomplish this will have to be devisive, as for example a graduate program in design through the M. E. Department, (publishing this program and the priority for supporting graduate students still needs attention), but however accomplished, such breadth is much needed.

NEW PROGRAMS

Specifically, the new programs the Basic Engineering Department needs to implement are as follows:

1. Our relationships with high schools need strengthening. We have not yet determined the exact form that this will take. We are seriously considering several possibilities including agressively moving into the JET's program, visitations to local high schools, etc., but alternatives yet need to be considered to determine which will yield the greatest return, and what resources are needed.

2. We need to vigorously pursue the industrial design program operating through the Mechanical Engineering Department. We hope the paper work will be complete by the middle of the spring semester and approved by next September. A cursory list of course titles, which we intend to refine and develop, is attached as Appendix A.

3. We must actively pursue our plans for a masters degree in engineering education. The draft of our position paper outlining this program is attached as Appendix B. We intend to follow through on this objective as rapidly as our resources permit.

4. We hope the masters program in engineering education will provide the basis for a faculty exchange program with community and junior colleges. It does appear to us, however, that the masters program comes first because it gives structure to the work exchange faculty will do on our campus, consequently the exchange program will be held back for the present.

5. We intend to continue to pursue outside funds for summer programs for high school drawing teachers, and advanced programs for high school students. We have been turned down for the summer of 1967, but our experience with these proposals gives us confidence that we will succeed in the summer of 1968.

SUMMARY

The following timetable summarizes the needs of the Basic Engineering Department, and identifies these needs with specific programs over the next three to four years.

Program	Minimal Additional Staff Needs	Estimated Cost	Date
1. Normal growth of undergraduate student body, and active program of relations with high schools.	1 Man (Instructor or higher) (Possibly F. T. E.)	$7,500.00	Fall, 1967
2. Design Program as a Minor to the Masters Degree in Mechanical Engineering.	1 Man (Assist. Prof. or higher)	$10,000.00	Fall, 1968
3. Masters Degree in Engineering Education	1 Man (Assoc. Prof.)	$12,500.00	Fall, 1968

Respectfully submitted,

Edward J. Rising
Acting Head
Basic Engineering

Preliminary List of Industrial Design Courses

Existing Course:

Introduction to Product Design 307 - 3 credits. Active encounter with human values in design. Lectures cover central philosophy of product design, with emphasis on the relation between technical and human values, creativity, and design methodology. Laboratory exercises include the development of simple product concepts visualized in rapidly developed three-dimensional mockups.

New Courses:

Elementary Product Design - 3 credits. The aesthetic qualities of manufactured objects explored through example, analysis, and inventive laboratory procedures. Design problems stress proficiency of aesthetic judgements and skill in the use of perspective, color, and rendering techniques to communicate design techniques to others.

Industrial Product Design I - 3 credits. Analysis and design of machine elements and assemblies. Synthesis, practical workability, and ease of manufacture will be emphasized through several short projects.

Industrial Product Design II - 3 credits. Emphasis will be placed on the actual process of design. The lectures and laboratories will be devoted to the design of a complete and complex machine. This will demand the application of knowledge obtained in other courses.

Human Factors in Product Design - 3 credits. Design of products with emphasis upon human anatomy. Study of dimensional and strength characteristics of human anatomy, capabilities and limitations of senses, responses to sensory stimuli and effects of environmental conditions, motivation and fatigue. Primary emphasis will be upon design that satisfies human needs of ultimate user of product or system. Human factors knowledge actively incorporated into the design of working models.

Materials and Structures in Product Design - 3 credits. Laboratory experience with materials and structures with emphasis upon concrete, metal, wood, and plastics and aesthetic approaches to new structural shapes. Concepts developed into three-dimensional mockups and finished models.

Advanced Product Design - 3 credits. Integration of skills, methods, and knowledge obtained in other courses, toward the development of products which incorporate moving parts. The project will be carried through phases of research, analysis, programming, alternative concepts, concept selection, iteration, prototype and working model construction and formal presentation to a professional jury.

Philosophy of Product Design - 3 credits. An introduction to the philosophy of comprehensive design. A discussion of the attitudes and viewpoints of the designer and an investigation of the techniques of analysis, synthesis, and evaluation that he uses. Emphasis will be placed on understanding the creative process and the factors that influence it.

Design in the Corporate Environment - 3 credits. A discussion of the respective contributions of engineering research, marketing, manufacturing, finance, and other corporate functions to comprehensive design. Studies will center upon the relationship of the design engineer to the corporate design team and the organization and control of this team for greater effectiveness.

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From: E. J. Rising Date: January 17, 1967

To: To Whom It May Concern

Subject: New Graduate Program

It is the purpose of this memo to present some of our preliminary thinking, to those who are interested, with the hope that it will stimulate comments and criticisms. We hope that the feedback will be constructive so that it will help us develop further and eventually result in the fruition of a program to meet the need that we feel is so urgent.

NEED: The Basic Engineering Department of the School of Engineering has been attempting to secure people to fill three possible positions by September, 1967. Through extensive personal contact, trips, letters, etc., we have been able to obtain only two names of which one appears promising.

This experience has sparked discussion among our own staff, and discussion with professional colleagues at other schools. We find our own problems are in no way unique. Indeed, the problems of other schools are in many cases more acute than our own.

It appears that the picture is complicated by the fact that the kind of individuals we need have never been in large supply. Our charge is to work in a creative way in the high school--engineering college interface. This responsibility implies teaching, advising, and orientation, all of which extends to some degree back into the high school and up through the first year of engineering.

It is always difficult to attract creative and talented people to work in pre-professional programs. Individuals with a high degree of creativity, up-to-date professional training, who are reasonably agressive and have high intellectual capabilities are generally attracted to the frontiers of their professional area. But, these individuals will never have students to work with if there is not dedicated, skillful teaching and advising at the pre-professional level.

The sources of supply of teachers who will work at the advanced levels in various professional discipline are reasonably well known, although some would argue they are inadequate. However, there are no known sources of supply of individuals to work at the pre-professional levels with the types of problems that fall in our area of responsibility.

The most effective thing we could do for our own advantage in this situation is to secur the junior colleges for fruitful candidates. Because of the relatively large number of junior colleges, the relative instability of some of the newer ones, and the added attraction of teaching at the university level, it is clear that we could move into this situation and obtain for our own use some of the best and most promising personnel now operating in the junior and community college system. It is entirely possible that in the longrun some may not measure up to our standards, and we could not offer them tenure and have to run them back into the system from

which we obtained them.

Above and beyond the moral problem of using techniques of "raiding" and exploitation as an operating policy, there are two practical reasons why such a strategy is undesirable. First, there is the problem of the preparation of the junior college transfer students that come into our program. At present, upwards of 25 percent of the incoming students in the School of Engineering in any given year come in as transfer students, many from junior colleges. A short run policy of raiding the faculties of junior colleges would cause a deterioration in the quality of this component of our student input. Second, such a policy would make it practically impossible to staff the pre-engineering programs in the junior colleges, which would mean that these programs would likely be curtailed or severely cutback due to lack of staff; this of course would mean that this input source would tend to dry up.

Finally, and probably most importantly, it would appear that the School of Engineering at the University of Massachusetts ought to take some leadership in connection with these programs rather than place obstacles in their path. A long-run solution that would not only help us, but also help with the upgrading and improvement of the programs in the junior colleges would be a happy solution for all concerned.

POSSIBLE PROGRAM: A program designed to train people to work in the high school--engineering school interface would not only help us solve our problems, but serve as a source of supply of staff to junior colleges who are currently having even more difficulty than we securing competent individuals with adequate credentials and experience for the job. Such a program must be carefully constructed of two basic components; a solid background in engineering and training in those phases of education that are most pertinent to this situation.

It is our feeling that the program should certainly not extend more than one calendar year in length, and preferably be contained within two semesters; it should be offered to people who have a Bachelor's Degree in Engineering or its equivalent; it should contain some internship experience with engineering freshmen; it should contain a solid core of engineering courses in the relevant disciplines; it should contain a solid core of courses in the field of education.

It is very difficult to meet all the above criteria, but thoughtful consideration of the problem and discussion with some of those concerned have yielded the following outline of courses that we propose for consideration:

The following topics from the field of Engineering, and closely related fields, appear relevant to such a program. (Up to a total of approximately 15 to 18 credits)

Computer Science	3 to 6 credits
Graphic Science	3 to 6 credits
Engineering Design	3 to 6 credits
Internship and Seminar	3 to 6 credits

The following topics seem most appropriate from the field of Education:

Learning Theory	3 credits
Counseling and Guidance	3 credits
Test and Measurements	3 credits
Educational Sociology	3 credits

A thesis or project to the extent of three to six credit hours would be required.

A careful examination of the catalogues of the University of Massachusetts do not reveal any degree program under which the above could be presented. While the program for the Master of Arts in Teaching probably comes the closest, the requirements total 39 credit hours, which is a longer program than is envisioned, and in addition would require more than one calendar year to complete. The other alternative, the Master of Science in Education program, clearly would not be appropriate because of the credentials required for admission. The program envisioned here would be directed specifically toward candidates with and engineering background, and in addition the Master of Science in Education program requires such a heavy concentration in the course work within the field of education that too little time would be left for the disciplinary training in the relevant fields of engineering.

Our thinking on the matter is still exploratory, and while the above objections may be countered or accommodated, and while in an institution of this size there may very well be programs of whose existence we are unaware, it appears at present that a program to meet these objectives will need to be built as a new program from the ground up.

UNRESOLVED PROBLEMS: The above proposal outlines some of our preliminary thinking in connection with the possibility of a program in engineering education. Naturally, we have thought long and hard about the possible level and result of such a program. Our present thinking is that this program should be appropriate for a Master's Degree. However, we have a problem in "naming the baby." It would appear that the name "Master of Science in Engineering Education" might be most appropriate. Such a name has the advantage of being both descriptive and appropriate, yet does not identify the program specifically with an existing component of the University whose objectives are already firmly established outside of the frame of reference of the activities contemplated.

There are many problems developing such a program from the ground up, the most serious of which we can identify as being:

a. Acceptance of our faculty as members of the graduate faculty. (They are active and productive within their own discipline but who lack some of the trappings and credentials of traditional academia.)
b. The development of a more broadly based research effort. (Our present thrust has been toward projects and programs, and though generally successful, they generally have not been supported by controlled research.)
c. Support for graduate students.
d. Sufficient support for, and a source of, additional faculty.

Our present thinking and inquiry indicates that it will probably be possible to obtain National Science Foundation support for such a program. It is our understanding that programs of this kind, designed to make a specific impact on the preparation of engineers and scientists, are being received quite favorably. In addition, we cannot help but observe that many retired military people are finding their way into this field by rather circuitous routes. It is worth noting that such retired military people, often with service academy background which closely approaches engineering training, have "GI Bill" support as well as desire to enter into an academic atmosphere. Lastly, we cannot help but observe that such a program will help us attract the very best type of staff that is available because of the professional opportunities such a program would afford. (With such a staff the implementation and development of new research fields becomes a manageable task.)

The foregoing is presented with the idea that it will engender discussion and hopefully constructive criticism.

Sincerely,

Edward J. Rising
Acting Head
Basic Engineering

General Planning Report

of the

Chemical Engineering Department

The objective of this report, submitted in response to Dean Picha's memo of August 29, 1966, is to summarize the current views of the department concerning the directions and extent of its growth anticipated for the next 5-10 years.

Foremost among these anticipations, and absolutely prerequisite to realizing the others, is the new building. The department's present space needs are being met (in amount only) by space assignments in five (5) different buildings, its own original space in Goessmann Laboratory having reached the saturation point two years ago. The reassembling of the department's physical facilities and a further major expansion, both of which can be done only via a new building, are by far the department's greatest and most urgent need. The level of operations called for by 1972 simply cannot be approached, and the department's programs and enrollments will have to be severely curtailed below the anticipated demands, unless this building is made available at the earliest possible date. In order to achieve this, every effort must be made to obtain planning money for the building during 1967.

The level of operations anticipated for 1972 and 1977 are indicated in terms of enrollments and faculty in the following table:

	Undergraduates (not incl. Freshmen)	Graduate Students Full-Time	Graduate Students Part-Time	Faculty (F. T. E.)
1966-7	85	21	25	8
1972	170	50	35	16
1977	200	100	50	25

The leveling off in undergraduate enrollment is a plateauing similar to that expected in the enrollments of both the total University and the School of Engineering.

Academic programs were divided into the two categories, (a) departmental, and (b) interdisciplinary, and were discussed by the full departmental faculty to evolve a "departmental position" on each. Discussion was generally not in terms of specific curriculum details, but more on the questions of desired emphasis or direction in the departmental programs, and degree and means of participation in the interdisciplinary programs. The faculty member most closely associated with each of the interdisciplinary areas then summarized the resulting departmental position on that area and contributed that section of this report.

Departmental Programs

The undergraduate program was judged in last year's ECPD accreditation as having a good, strong curriculum but being somewhat heavy in terms of total credits and perhaps in chemical engineering courses, while somewhat light in the cognate areas of engineering. As reported in the attached articles seeking answers to the question, "What should chemical engineering education be providing to best prepare tomorrow's chemical engineer?", there is also some rather general agreement on a few areas in which a national trend of increasing emphasis is deemed desirable.

It is felt that the current well-established trends of increasing application (in the practice of the profession) of advanced math and of sophisticated automation are certain to continue, and that therefore a further continuation of the increasing emphasis already being given these two areas in the course content of both undergraduate and graduate programs is called for.

There is also a widespread feeling that a return to greater emphasis on design and on laboratory projects is highly desirable, and that in both of these areas as much opportunity as possible should be provided the student for original, independent, creative thinking, with the objective of developing this very important component of his professional competence and self-sufficiency.

While the desirability of increased emphasis in the above four areas might apply equally well to other branches of engineering as well as chemical, there is a fifth area, unique to the latter, about which the profession has voiced concern. That is chemistry, and it is felt that a strong chemistry segment in a chemical engineering curriculum is a very desirable thing, especially for the chemical process industries. The applied chemistry of these industries is a specific area which many feel should receive more emphasis.

On the non-technical side of the curriculum, there is virtually unanimous agreement that there is a general and important need for more effective teaching of communication skills, particularly writing. Apparently this has long been and still is the most widely voiced complaint of industry concerning engineers and scientists in general.

After the School of Engineering committee reaches its decisions on any changes in the School curriculum, and the University committee reaches its decisions on any changes in the University core curriculum, etc., a departmental committee will review the chemical engineering curriculum for appropriate revision to incorporate those changes and make whatever others it feels are needed for maintaining as strong and up-to-date a curriculum as possible.

In the graduate program, no near-term major changes are foreseen in the pattern of basic courses and degree requirements. Rather it is anticipated that there will be added occasional new courses of a more specialized nature to be offered probably on an alternating year basis as new faculty members join our department with special fields of interest. Some of these courses may become part of new interdisciplinary programs. The graduate program, like the undergraduate, will be reviewed for revision and updating several times through the next decade, and appropriate changes (not forecastable in specifics at this time) will be incorporated.

Interdisciplinary Programs

Since the details of any new interdisciplinary program should be worked out by an interdisciplinary committee established for that purpose anyway, the department restricted its considerations primarily to the questions of the extent of its interest and the general nature of its expected participation in each of the following areas. While there are no definite plans at present for recruiting new faculty to contribute in any specific way to any particular interdisciplinary program, it is certainly anticipated that potential roles in specific programs will be a factor in some instances in future recruiting, and also that frequently new faculty members will happen to have interests and capabilities in one of the interdisciplinary programs anyway.

Polymer Science and Engineering

The Interdisciplinary Program in Polymer Science and Engineering, which is directed at granting M. S. and Ph. D. degrees in this discipline, was initiated in September, 1966. The Chemical Engineering Department has one faculty member contributing to this program: R. W. Lenz. Lenz devotes approximately 1/2 time to the Program and 1/2 time to normal activities of the Chemical Engineering Department.

The Program now has two other part-time contributors, Professors Stein and MacKnight (both members of the Chemistry Department), and a full-time Chairman, Professor Porter. It is expected that two new full-time faculty members will be added to the program next year. It is planned that the Program activities will occupy two floors of the new Graduate Research Center, and by the time of this move, the projected number of graduate students will be approximately 25. Ultimately it is visualized that the number of graduate students in the Program will be approximately 50, with the remaining space required to be planned possibly in new engineering facilities, particularly in the new Chemical Engineering Building when it is constructed.

Ultimately the Polymer Science and Engineering Program may be expanded into a Materials Science Program to include other disciplines such as Metallurgy and Ceramics. Eventually the Program, in either form, may take on the status of a department.

In addition to Lenz, Professors Eldridge and Chappelear both have research interests in polymer science and engineering. It is expected that Chappelear will include material pertinent to polymer engineering in his Advanced Kinetics graduate course, and Lenz will cover this subject in depth in a course on Polymer Processing and, from time to time, in Special Topics courses and Materials Science Seminars. Chemical Engineering aspects of polymer science and engineering are also included in courses on Rheology and in the Introduction to Polymer Science course.

It is the desire and intention of the Chemical Engineering Department to continue to encourage and support the Polymer Science and Engineering Program. As the Program expands, the Department may wish to add additional members with either Polymer Science or Materials Science interest and expand the association of the Chemical Engineering Department with the Program, both through courses offered and research pertinent to these areas.

Professor R. W. Lenz

Aerospace Engineering

As a contribution to the Mechanical Engineering Department's new Aerospace Program, the Chemical Engineering Department would expect to be able to offer within the next 2 to 3 years a 1 or 2 semester course in the fundamentals of combustion. While the specifics of such a course would be developed jointly by the departments, it is envisioned that the course matter would be more theoretical than applied. The study of combustion cuts across several areas including thermodynamics, heat and mass transfer, chemistry and fluid flow. Consequently, it is difficult to comprehensively outline the specific areas of concern in such a study. Recognizing this, typical areas that might constitute a course(s) would include: theoretical aspects (chemistry and kinetics) of chain reactions for various fuel systems, e.g., reaction mechanisms and rates, chemical structure effects,

sensitization and inhibition by additives, and explosion limits, quenching, flame stabilization, flash-back, blow-off, deflagration and detonation; and thermodynamic properties of the products of combustion.

In addition to offering one or more courses the Department would also contribute to the Aerospace Program through its research activities. This contribution is an immediate one as there are two to three projects that relate to this area presently under way. Furthermore, additional activities in this area are anticipated.

Professor L.H.S. Roblee

Systems Engineering (or Engineering Cybernetics?)

The Chemical Engineering department urges the initiation of an interdisciplinary program in "Systems Engineering" and is eager to participate in such a program at both the graduate and undergraduate level. Broadly speaking, we conceive this program as encompassing the area of man-machine and machine-machine communication to define, analyze and implement a physical configuration to achieve some objective.

Our department offers several courses at both the undergraduate and graduate level which would logically fit into this program. At the undergraduate level, Instrumentation (Ch. E. 375), Automatic Process Control (Ch. E. 376), and Analog Simulation (Ch. E. 374) are directly applicable. Plant Design (Ch. E. 384) is also a strong possibility. At the graduate level, Advanced Process Control (Ch. E. 708), Process Dynamics (Ch. E. 708) and Optimization Techniques (Ch. E. 709) are logical candidates, as are the applied mathematics courses (Ch. E. 661, Ch. E. 703 and 704) and the courses in transport phenomena (Ch. E. 711 and 712). Indeed it is difficult to eliminate many other courses from consideration for this program, since historically Chemical Engineering has always been systems oriented. Present and anticipated research activities in the areas of optimization, control and dynamics, analog and hybrid computation would fall under such a program and would be strengthened by the active participation of the other engineering disciplines.

While an interdisciplinary program in "System Engineering" could be easily initiated by the School of Engineering, we feel careful consideration should be given to the selection of the title of the program (i.e., Is systems Engineering the most appropriate term?) and the scope of the program (e.g., Would strong liason with the physical, biological and medical sciences be desirable?).

Professor R. J. Novak

Ocean Engineering

The most profitable contribution which the Chemical Engineering Department could make at this time to a program in Ocean Engineering would be graduate level research. The types of problems to which chemical engineering could contribute directly are development or refinement of processes for recovery of dissolved materials from sea water, desalination, and processing of materials recovered mechanically from the sea -- fish, sea weed, iron manganese nodules.

Additionally we could offer a course at the Senior-Graduate level on technology of current sea-based industries. At this time the only materials recovered economically from sea water are salt, bromine, iodine, and magnesium. Great interest has been shown in the past few years in development of economic processes for desalination of sea water - the production of potable water from sea water. The fishing industry has been established for centuries, yet there are problems in handling and processing the fish and also in waste disposal. Harvesting and processing of sea weed is largely a primitive industry - it is carried on extensively in other countries but is of little importance in the U. S. Recently plans were announced by an offshore drilling company and an oil company to recover iron-manganese nodules from the Pacific continental shelf.

Offering such a course might be a logical way to get started in an Ocean Engineering program. Historically, chemical engineering began as a study of established chemical technology and from this developed

our modern, scientific specialties of thermodynamics, kinetics, etc. It is possible that a similar development could occur with Ocean Engineering.

Some aspects of Ocean Engineering envision humans working below the surface of the sea. Chemical engineering could contribute to problems of underwater habitation via parti [illegible] in programs of Bioengineering and Environmental Engineering.

If it should be desired to start the above program, it should be possible to do so with our present staff without serious difficulty; however, it would be preferable to add a man to the Chemical Engineering Department whose interests lie in this field. The technology course could be developed and taught within six months. Planning and initiating suitable research projects might take up to two years.

Professor R. S. Kirk

Environmental Engineering

In general, Environmental Engineering deals with air pollution, water pollution, waste disposal of all types and life support systems in hostile environments.

Abatement of pollution and maintenance of closed circuit breathing systems involves, principally, mass transfer, heat transfer, chemical kinetics and thermodynamics. The department of Chemical Engineering offers a number of courses in these subjects.

Abatement of air and water pollution, caused by industrial wastes, is chiefly a matter of heat and mass transfer, liquid-liquid, liquid-solid, liquid-gas and gas-solid. All of these subjects are covered by Ch. E. 255, 256, 288, 711, 712, 722, 731, and 732.

The real cause and mechanisms by which relatively harmless air pollutants are converted to lachrymators and pathogenic substances by sunlight are relatively unknown. Any attack on this problem could involve both chemical kinetics and thermodynamics. These subjects are covered by Ch. E. 380, 381, 382, 701, 702, and 706.

It is true that the emphasis in all of these courses is aimed at the most economical means of producing industrial materials rather than the

abatement of pollution. However, the emphasis may be changed very easily in any of the above courses merely by changing the nature of the problems undertaken.

Professor K. D. Cashin

Biomedical Engineering

The Department of Chemical Engineering is interested in supporting an interdisciplinary program in biomedical engineering. Because of the intimate connection between many biomedical engineering problems and the chemistry of the human system, the Department of Chemical Engineering could make important contributions to such a program. The Department feels that the best way that it could contribute to the program would be to add a new staff member who was competent in the area.

In starting a new program in any field, problems are bound to arise. The Department feels that this is particularly true in the case of biomedical engineering. A very important problem which exists in this area is the difficulty which medical people and engineers have in communicating ideas to one another. Secondly, the location of the Medical School in Worcester and the concomitant lack of communication further adds to the difficulty of exchanging ideas and establishing a successful research program. Lastly, while other interdisciplinary areas could utilize courses which are already in existence, biomedical engineering would probably require specialized additions to the Department's curriculum. The overall conclusion of the Department is that it would be more difficult to support a program in biomedical engineering than it would be to support most of the other interdisciplinary areas.

Professor T. J. McAvoy

List of Attachments

1. "Educating Tomorrow's Chemical Engineers", Chemical Engineering, p. 103, Sept. 26, 1966.

2. "The CPI and the Chemical Engineer: What they told the Goals Committee", Chemical Engineering, p. 111, Sept. 26, 1966.

3. "An Approach to Meeting the Challenge to Design", Chemical Engineering Progress, 62, No. 10, p. 30, Oct., 1966.

4. "Systems Engineering at A. D. Little", private communication with report.

5. "The Oceans: Technology's New Challenge", Chemical Engineering, p. 191 Oct. 10, 1966.

6. "Chemistry and the Oceans", Chemical & Engineering News, 42, No. 22, pp. 33A-48A, June 1, 1964.

7. "Chemical Engineering in Medicine", Chemical Engineering Progress, 62, No. 12, p. 102, Dec., 1966.

8. "Bioengineering emerging as separate field", Chemical & Engineering News, p. 86, Nov. 7, 1966.

9. "Man in the Sea", Industrial Research, p. 74, Oct., 1965.

10. "Growing Emphasis in Ocean Research", Industrial Research, p. 37, Aug., 1966.

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From: Civ. Engr. Faculty Date: January 11, 1967

To: Dean of Engineering (copies to C.E. Faculty and Engrg. Department Heads)

Subject: Prediction of five and ten year status of Civil Engineering Department

The following table compares our present state with our predictions for 1971-72 and 1976-77.

STAFF-STUDENTS	1966-1967	1971-1972 (No. of Persons)	1976-1977
UG Students (II, III, IV)	172	250	300
Grad. Students (FTE*)	35 1/2	120	240
Total Faculty	15 1/2	36	50
Faculty (EFT Teach.)	12 1/2	24	30
(EFT Res.)	3	12	20
Post Doctorate Staff	0	4	7
Staff Research Effort (last 2 items)	3	16	27
Transp.-Urban	0	2	4
Water Res.	0	1	2
Environm. (Sanitary)	1	6	8
Ocean Engrg. (specific**)	0	1	2
Struct. - Mechanics	1	3	5
Fluids	1	2	3
Soils	0	1	2
Bio-Medical	0	1	1
Materials**	-	-	-

LABORATORY SPACE (RESEARCH AND INSTRUCTION)	1966-1967	1971-1972 (Sq. Feet)	1976-1977
Transp.- Urban	0	1000	2000
Water Resources	0	-	-
Environmental	3600	10,000	15,000
Ocean Engrg.**	-	Fl. Lab	Fl. Lab.
Struct. - Mechanics	same	same	same
Fluids	3200	10,000	15,000
Soils	same	same	same
Bio-Med.**		-	-

Expected new teaching and research programs and additions to existing programs are reflected in the figures for research effort above.

Continuing Education is an important topic today. Because of our geography we have made no allowance for such a program, expecting that in our case the most probable involvement will be to the extent of students enrolling in our normal graduate programs.

ston Campus: We expect not to be concerned with the Boston Campus Program which expect will, at the most, offer two undergraduate years in engineering.

dergraduate Curriculum. We expect a reduction in credit hours to a total of 5. We do not expect to have a five-year undergraduate program.

EFT - equivalent full-time

Parts of any research effort in Ocean Engineering, Bio-Medical engineering and in Materials will utilize other staff and facilities (e.g., Structures, transportation, environmental, soils, etc.)

is memo was prepared by M. P. White after discussion of the question by the llowing group: R. A. Archer, C. E. Carver, M. M. Miller, M. P. White.

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From G. Dale Sheckels Date January 13, 1967

To Dean Picha

Subject Electrical Engineering Department Five Year Plan

Attached is the five year plan for the Electrical Engineering Department. It is only the best prediction based on present desires and available facts at this time. It will be subjected to continual review, and will be updated and modified where desirable as time progresses.

It should be emphasized that these plans are my own and have not been approved by the existing faculty of the Electrical Engineering Department. Some parts have been discussed with some members of the faculty, but no overall approval has been sought.

Respectfully submitted,

G. Dale Sheckels

G. Dale Sheckels, Head
Department of Electrical Engineering

University of Massachusetts
Electrical Engineering Department

Five Year Plan

Plans for the development of the Electrical Engineering Department for the next five years are divided into seven sections: A) Faculty; B) Research activities; C) Graduate program; D) Undergraduate program; E) Supporting staff; F) Facilities; G) Budget estimates. The most important part of any plan for the future is, of course, the recruitment and development of faculty. The other areas mentioned above are all subsidiary and are dependent to a large degree on the success of the faculty program. The subsidiary areas are not listed in any order of importance or priority.

A) Faculty

At the present time, the Electrical Engineering faculty consists of 13 full time men and one half-time man. This faculty should be increased by three men on September 1, 1967, by two men on September 1, 1968, and by one man on each of the succeeding years, 1969, 1970, and 1971. Replacements for resignations and retirements will be in addition to the above increases. All of the faculty additions will have Ph.D.'s from a diversity of schools and none will have a degree from the University of Massachusetts. Ph.D.'s in Electrical Engineering will be preferred, although a Ph.D. in Physics with an interest in an Electrical Engineering area will be considered.

Professor Lovell has resigned effective September 1, 1967. Professor Roys will retire in June 1968 and Professor Maunder will retire on or before September 1971. Replacements for these will bring new Ph.D. additions per year to 4, 3, 1, 1, and 2. Professors Herchenreder and Scott presumably will be on leave during the 1967-68 academic year, each to work on his own Ph.D. research. If possible, their positions will be filled by visiting professors. Both Herchenreder and Scott should receive their degrees by September 1968. Other sabbatical leaves are not considered in the totals as they will also be replaced by visiting professors. The projected numbers of faculty and numbers of Ph.D.'s are best summarized in Figure 1.

The future faculty additions should have a research and teaching interest in one of the following areas: a) Modern control systems, b) Microwave antennas and electromagnetic theory, c) Bio-medical engineering, d) Solid state devices, d) Digital circuits and computing devices, f) Energy conversion. By 1971 these six areas should be filled in the following way:

a) Modern Control Theory
   1. Hutchinson
   2. Monopoli
   3. New man (added in 1967)

b) Microwaves, Antennas, and EM Theory
   4. New man (added in 1967)
   5. New man (to replace Roys in 1968)

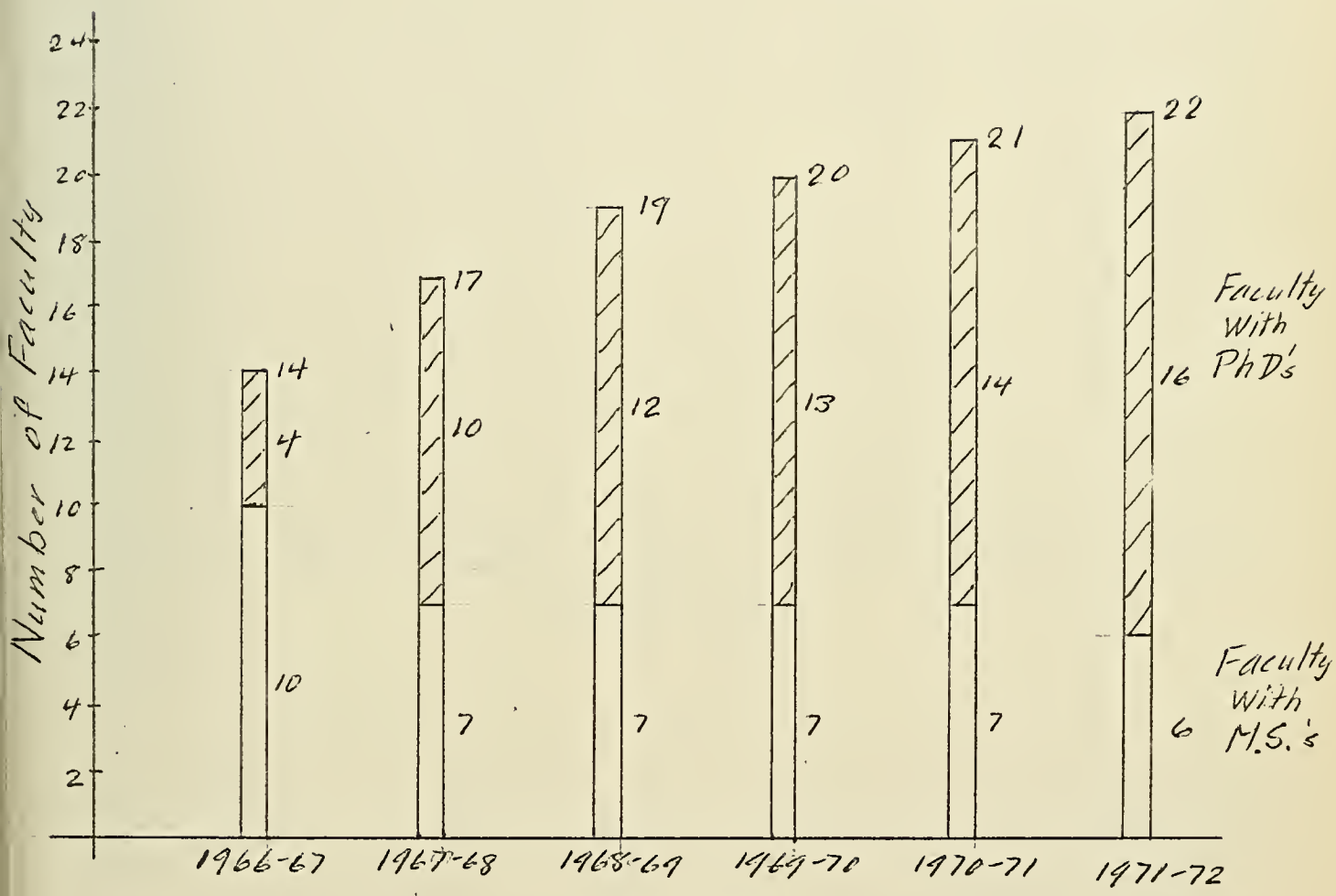
c) Bio-medical Engineering
   6. Herchenreder (Ph.D. in 1968)
   7. Scott (Ph.D. in 1968)
   8. New man (added in 1969)

A. Faculty (Continued)

d) Solid State Devices
   9. New man (added in 1967)
   10. New man (added in 1970)

e) Digital Circuits and Computing Devices
   11. New man (added in 1967)
   12. New man (added in 1968)
   13. New man (added in 1971)

f) Energy Conversion
   14. New man (added in 1968)
   15. New man (to replace Maunder in 1971)



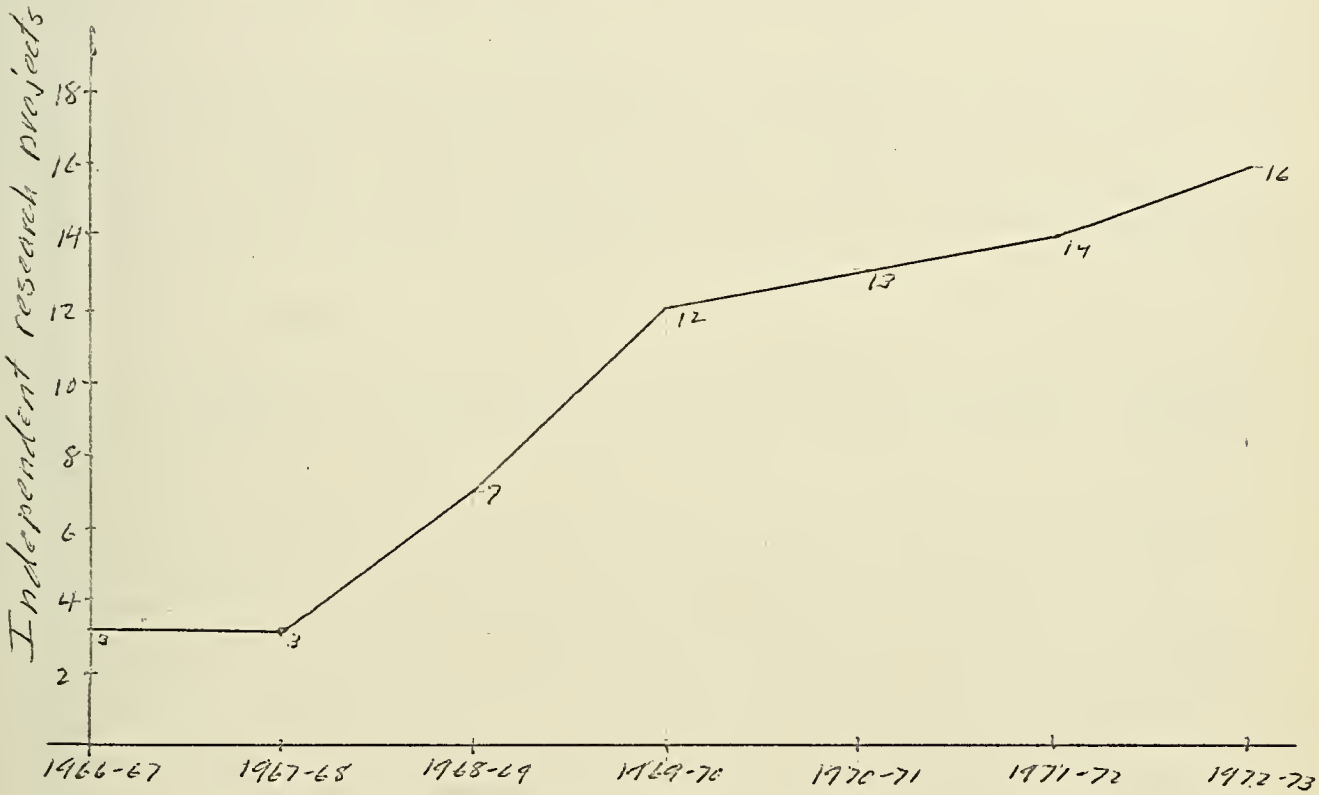
Academic Year
EE Department Faculty Projections

Figure 1.

It must be admitted that the above plans and projections are highly idealistic. From a practical standpoint, we should ever be ready to hire all the faculty we can, when we can, in any year, and in any interest area.

B. Research Activities

It is expected that each new faculty member will be engaged in his own research work in his area of interest within 12 months after his initial appointment. Each will have at least one graduate student helping him. The total number of research projects and the minimum number of graduate students working on research each year is summarized in Figure 2.



Academic Year
Research Activity

Figure 2.

Sponsorship of research work by industry and government departments will be encouraged, [illegible] much for the money it will bring in but for the recognition of the value [illegible] ty of the particular research work by an off-campus agency. This does not mean that unsponsored research will have a second-class status; most all research starts as unsponsored. The budget for each sponsored research grant or contract will contain provision for the support of at least one graduate student during the academic year and during the summer. Faculty with unsponsored projects will be assigned graduate assistants from the 03 account when they can be spared from the teaching responsibilities. Faculty with active research work in progress or in the initiation stage may continue to expect a reduced teaching load, nine or six contact hours, as the University's contribution to the research effort. There will be no 100 per cent research faculty appointments. Each man will be expected to do some undergraduate teaching along with his graduate teaching and his research. Since any research

is valueless unless it is communicated to others, publication and verbal presentation of results will be encouraged. Secretarial assistance will be provided for the preparation of papers for publication, and regular seminars will be scheduled for verbal presentation and discussions. Classified research will be strongly discouraged, since it cannot fulfill the communication requirement. It is expected that sponsored research budgets will contain provisions for publication costs and for travel. In connection with unsponsored research, travel expenses to meetings to present papers will continue to be paid by the University.

It is expected that all research work will be done within the framework of the existing Electrical Engineering Department and that there will be no separate organizations set up within or without the Department to perform the research function of the Department. Group association of faculty and graduate students working in common areas will be encouraged, but individuals will still be responsible directly to the Department Head and to each other within the Department.

C) Graduate Program

At the present time, the Department has an operating graduate program at the M.S. level. This includes a six credit research and thesis requirement. No important change is planned in this M.S. program during the next five years.

The Ph.D. program is now in the planning stages and should be operational by September 1967. Initially the automatic controls area will be emphasized and three new courses over and above the M.S. offerings will be listed. Since the faculty enlargement plan also calls for one additional man in the Solid State Devices area and in the Digital and Computer Devices area in 1967, one Ph.D. level course in each of these two areas will be added. By 1968, Herchenreder and Scott will have received their Ph.D.'s and a two course sequence in Biomedical Engineering will be added at that time. In 1968 the microwave replacements for Dr. Roys will take over existing microwave and electromagnetic theory courses. Also in 1968, the new Energy Conversion man will offer a new course in his particular area. All of these Ph.D. level courses will be offered on a demand basis, that is, only when they are required by the student's program. The courses in the M.S. program will all be offered once each year, regardless of the number of students anticipated.

The number of graduate students in the M.S. and Ph.D. programs will be limited somewhat by the available graduate student support. Research support will depend on sponsored research and will at the minimum level follow the curve of Figure 2. Teaching assistantships should increase at a rate of two per year. In September 1967, we should expect one University fellowship or NSF traineeship. In 1968, a year after the start of the Ph.D. program, the Department will be eligible for NASA traineeships and we should expect one more here. Thereafter, the fellowship support should increase one man per year. There will always be several self-supported graduate students and these should increase only slightly as the years progress. The expected total graduate enrollment is summarized in Figure 3.

too low
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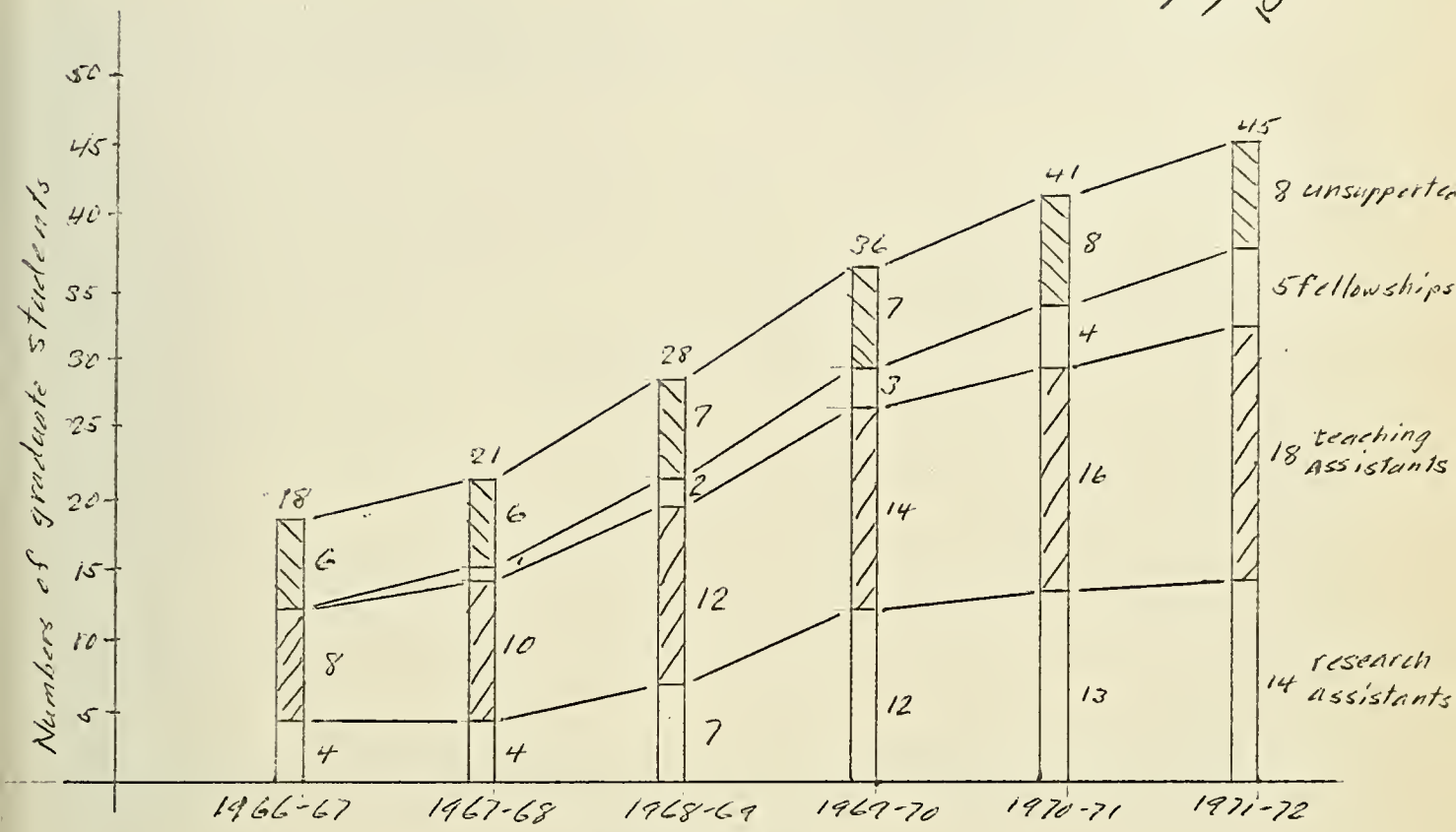


Academic Years.
Graduate Student Enrollment

Figure 3.

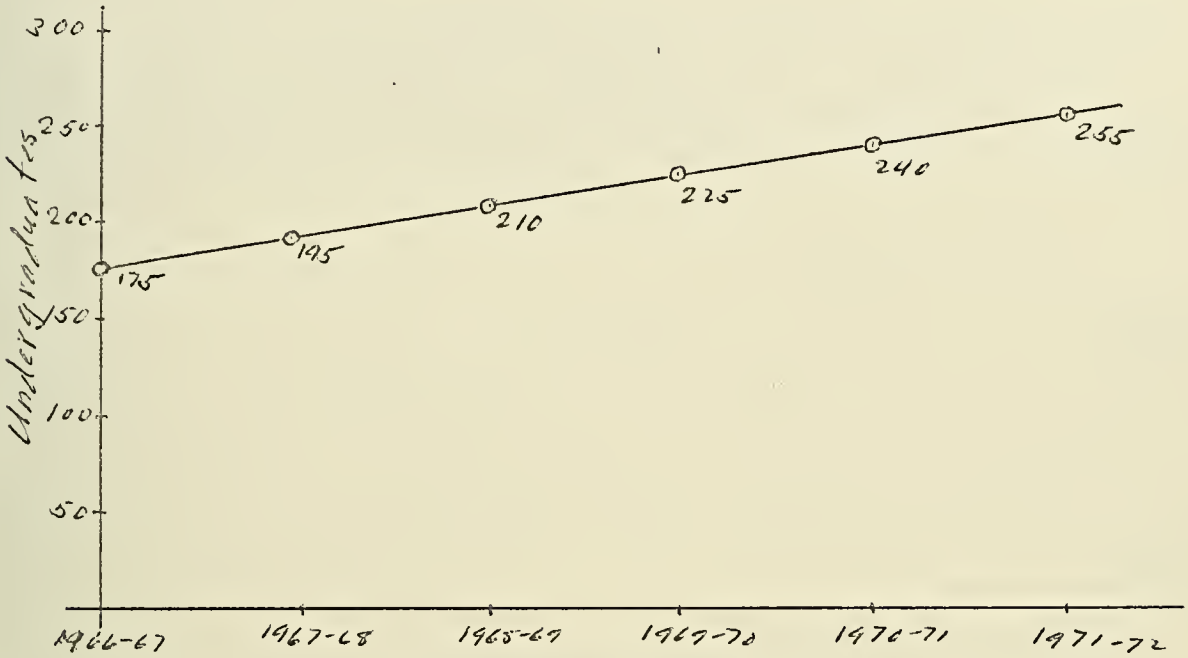
The Department is planning a graduate extension program with the General Electric Company in Pittsfield starting September 1967. The G. E. Co. will provide closed circuit T.V. equipment so that their employees can view our graduate classes and instructors during regularly scheduled day-time hours. An audio feedback line will permit questioning from the remote classroom in Pittsfield. The number of G.E. employees who will be registered in this extension program is so indefinite that no attempt has been made to include them in the totals of Figure 3. They will be for the most part M.S. degree candidates. Any Ph.D. candidates from Pittsfield will be expected to satisfy the University's on-campus residency requirements.

We should expect continued pressure to relax the research requirements at the M.S. level. After the Ph.D. research program is well established the Department will consider making the M.S. research optional but it will not be dropped completely.

D) Undergraduate Program

As indicated in a memo to Dean Lindsey dated November 21, 1966 the anticipated total enrollment in the sophomore, junior and senior classes

in Electrical Engineering will be 195 in 1967, 210 in 1968 and 225 in 1969. These figures together with the present 1966 enrollment, and projections into 1970 and 71 are shown in Figure 4.



Academic Years
Undergraduate Enrollment

Figure 4.

This is the roughest kind of an estimate and is based almost completely on a prediction made by Professor White of the Civil Engineering Department in his memo of November 4, 1966. One factor which may have a strong effect on our undergraduate enrollment is the development of the Junior Colleges. Their enrollment could increase faster than our own freshman enrollment. If this were the case and if their two years were acceptable in place of our first two years, we should expect an increasing number of transfers at the beginning of the Junior year. This would change the proportions of our effort in the three classes and could possibly increase the total enrollment above that of Figure 4.

Curriculum development during the next five years will depend to a large extent on the recommendation of the newly appointed Curriculum Committee. Some general ideas can be set down here but no time schedule for implementation will be given. In general, an attempt will be made to reduce the number of credits per semester. The two required "summer shop" courses will be re-evaluated and, if dropped, the most essential parts will be incorporated into the academic year courses. There will be continual review and experimentation with Electrical Engineering courses with the idea of keeping them updated in content and method of presentation.

Each permanent faculty member will be expected to teach at least one undergraduate course each semester. Course assignments will be according

to personal preference whenever possible. Graduate students will not be used for lecturers except in extraordinary cases, where the student himself is exceptional or where the teaching schedule requires an emergency fill-in.

E) Supporting Staff

At the present time the Department has one full time secretary and one half-time secretary, each devoting about half time to undergraduate work and half to graduate and research work. Assuming that the undergraduate and graduate secretarial work will increase in direct proportion to the increases in the respective groups of students, the projection in Figure 5 can be made.

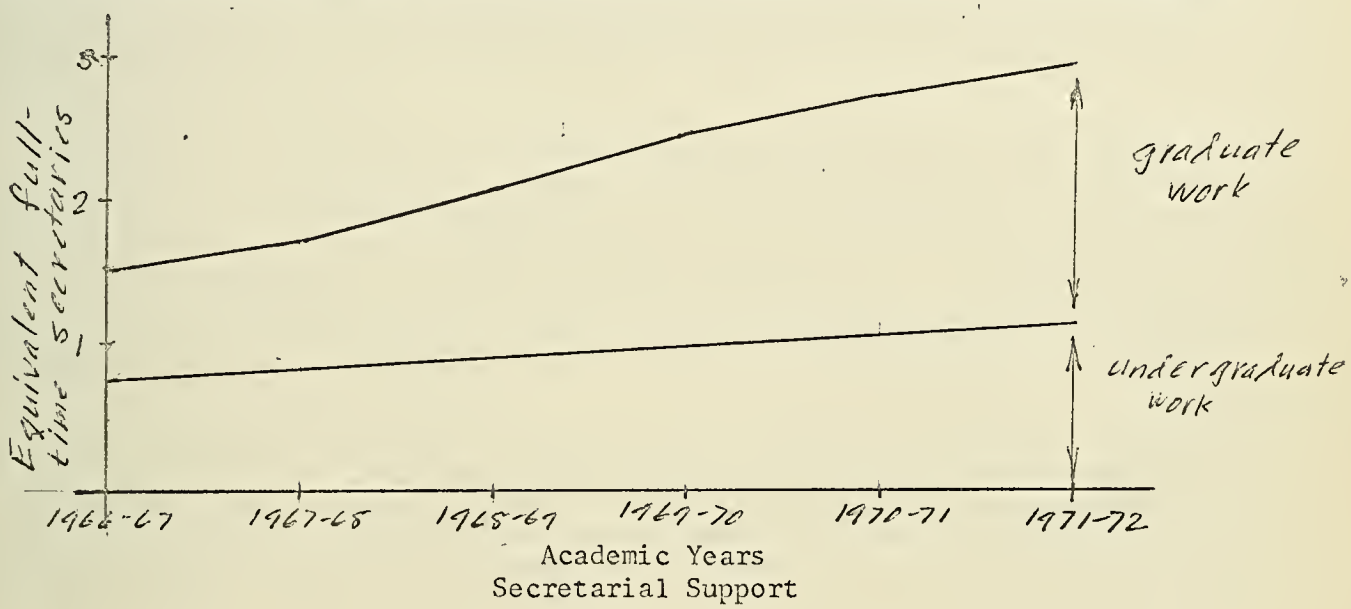


Figure 5.

From this projection, it is evident that by 1971, the Department will need an equivalent of three full-time secretaries with experience and efficiency equal to our present staff. If the added individuals do not have this level of experience and efficiency, then the numbers must be increased, even by a factor of two.

Our one electronics technician presently maintains and repairs all of the department's electronic equipment, plus equipment from other departments of the Engineering School including all of the analog computers. He also sometimes takes on jobs which the Graduate Office's electronics technician is unable to do. Our own research faculty will increase from four to sixteen men by 1971, and the technician support should increase proportionally. Extra-departmental electronic work probably will not increase as fast as our own, so we should plan on two more electronics technicians by 1971, one in 1967 and one in 1969.

F) Facilities

Serious problems will appear in this area: the need for additional office space for new faculty and secretaries. In 1967, the department head-quarters will move into Room 210. This will provide space for all the necessary

secretaries, the department head, and storage for supplies. This move will release two offices on the middle floor, one full-sized and one small 90 square foot office. The mail room which is now serving as the secretaries' office will not be suitable for faculty office. It is space which can be easily given up for the connection to the Graduate Research Center overpass.

At the present time the 14 faculty men each have individual offices. By 1971 the department will have eight additional faculty. With the two rooms vacated by the department office transfer, we will still need six more offices. The Computer Science Department will be moving into their new quarters in 1970 thus vacating Room 215. The existing partitions in this room are not satisfactory for faculty offices, but if they were replaced with cinder-block partitions, seven full sized offices could be placed along the outside walls. The eighth space would be needed for heating and air conditioning equipment. The central portion of the original large room could be used for research and teaching assistant desks.

By 1971 the department will have 14 research assistants, 18 teaching assistants, and five men on fellowships. All of these should have desk space somewhere. The 14 research assistants can all be accommodated in Rooms 14 to 22 inclusive on the ground floor. On the top floor there are eight small offices which could accommodate 16 of the 18 teaching assistants. The remaining two plus the five fellows could have desk space in the central portion of Room 215 and there would still be room to spare. There will be no problem on graduate student accommodation in 1971.

The seven rooms on the first floor (14,16,18,19,20,21,22) can accommodate all 14 of the research projects expected in 1971 along with the graduate student desk space. Larger projects can overflow into the 2800 square foot area of Room 15 which may be subdivided if desirable. The two additional electronic technicians can be accommodated in Room 17 on the ground floor. No problem is expected for research space.

By using the individual laboratories both morning and afternoon we can accommodate the expected increased undergraduate enrollment in 1971. The lab for the service course, EE 261, will need 12 sections in 1968, increasing to 16 sections in 1971. Since there are only 11 possible lab periods per week, some periods will have to have two sections simultaneously. These can be accommodated in adjoining Rooms 6 and 8, but additional equipment will be needed to handle the two sections together.

alternate Semesters?

The number of three-hour lectures will increase from the present 25 to 43 in 1971. We now use three classrooms. At the same usage level, we will need five classrooms in 1971. If the usage can be increased to the 35-hour-per-week level, we will need 3.7 or 4 classrooms in 1971.

In short, it appears that the only serious space problem is office space for faculty.

G) Budget Estimates

	66-67	67-68	68-69	69-70	70-71	71-72
	Actual					
01 Salaries[1]	$204,947	260,000	293,000	321,000	339,000	354,000
03 Services[2]	21,400	27,000	32,000	37,000	42,000	47,000
10 Travel	500	1,000	2,000	3,000	4,000	4,000
12 Maintenance	1,200	1,400	1,600	1,800	2,000	2,200
13 Supplies	3,000	3,500	4,000	4,500	5,000	5,000
14 Equipment	4,000	24,000	30,000	30,000	30,000	25,000

Notes:

1. Academic year salaries for professional staff plus calendar year salaries for secretaries and technicians. Three additional faculty for 1967-68, two additional for 1968-69 and one additional for each of the succeeding years. One additional technician for 1967-68 and one more for 1969-70. One additional half-time secretary in 1968-69, one more in 1969-70 and one more in 1970-71.

2. Undergraduate and graduate student labor plus graduate teaching assistants on Provost's 03 account. Two additional teaching assistantships each year.

Department of Mechanical Engineering

UNIVERSITY OF MASSACHUSETTS

January 15,1967

To: Dean Kenneth G. Picha
School of Engineering

From: John R. Dixon, Head
Department of Mechanical Engineering

Re: Long Range Planning Report for Mechanical Engineering

Introduction

My report consists of three major parts. First there is a discussion of the directions that I think engineering will take in the next five to ten years. This is done both from a mission viewpoint and from a discipline viewpoint. Next there is an outline of objectives for my Department in terms of specfic programs and activities. Finally there is a plan for organization of the Departmental activities in order to carry out our objectives.

Engineering Activity in the Future

I believe that we are just now seeing the beginning of an era of new and greater excitement and significance in engineering. Some years ago when I wrote "Lost Mission of Engineering" the situation was quite different from today. At that time, the Nation was consumed by the nuclear cold war with Russia, by frustration at being second in a space race with Russia, and by concern for domestic affluence. Motivations for engineers were substantially limited to military applications, to beating Russia in space, and to designing and producing luxury products for conspicuous consumption.

At the present time, however, there are some new and different motivations. Competition with Russia in space remains but we are confident now and are much more aware of the excitement of the exploration itself. The passion for affluence remains but has been joined by concern and action for social-technical problems such as air and water pollution, transportation, technical obsolesence of people, etc. A new mission has been created by the growing interest in the ocean. Military applications remain

but take on a new perspective in the absence of daily threats of nuclear annililation. Finally, techniques and equipment developed by the advanced technologies ~~xxxxxxxxxxxxxxxxxxxxxx~~ are reaching conventional industry at an increasing rate. An example is the computer. Also, concepts of systems and optimization and simulation are moving into smaller industries.

Though salaries will play an important part in increasing the attraction of young people to engineering, especially for that large social-economic group which is sending its first generation to college, it is my continuing opinion that future increases in enrollment will result more from the excitement and significance of the new engineering activities and missions. Though it is not common to talk about it, young people, even engineers, possess an idealism and a desire for meaningful occupation that is going to be better satisfied by engineering in the near future than it has been in the recent past.

The mission oriented activities that I see being important in the near future are thus as follows:

Aerospace: Should remain at about the present level with little growth or decline. We will go to the moon with manned missions and go farther with unmanned. New earth related mission will be found such as weather or communication applications. Then we will keep going out with man.....

Ocean: This is bound to begin and to grow. We will explore and develop our technology with manned and unmanned missions. The ultimate application of the ocean has got to be food. I think we will be slow to realize this point because it will be the rich and well fed Nations that will begin the exploration. However, world population and nutrition problems dictate that the ocean must eventually be used as "farmland". I believe that we should bear this application is mind as we proceed with the initial exploration and technological development.

Social-Technical: This is an area that must grow due to the pressures of population and the problems of huge cities. Among its specific problems are air pollution, water pollution, urban and interurban transportation, conservation, urban housing and recreation, etc. Many problems are engineering ones inthis area, though few are isolated from very difficult social, economic, and political considerations.

Industry: I don't think industry is going to grow, except in proportion to population, as much as it is going to change. The instruments of the change are the computer and such new concepts as systems design, optimization, probability, etc. New materials and uses are significant instruments of change, also. We in engineering education are going to have to be simultaneously bold and careful if we are going to serve our students well in this era of change in industry. It appears quite certain that there is going to be a growing emphasis in engineering education on the needs of industry, but we will have to be ~~careful enough not to lose the old needs and bold enough not to~~ bold enough to serve the ~~new needs and careful enough not to lose~~ new needs with new subject matter and careful enough not to lose our traditional emphasis on solid content, well taught with an engineering philosophy.

Military: The nuclear stalemate should not result in much growth or decline of engineering attention. Vietnam may well continue for some time to change the emphasis of engineering activity for the military, but it does not seem to me that this is going to be a tremendous growth situation for engineering even if the war continues for some time.

In summary, I see aerospace steady, ocean engineering and social-technical applications growing, industry changing, and the military adjusting to Vietnam but not growing as an engineering mission. As I noted earlier, it is an exciting time for engineers.

It is also useful to look at the future in terms of subject matter disciplines. I am restricting my coverage to those disciplines which are within or partially within Mechanical Engineering. These may be broken down as follows:

Fluid-aero-gas dynamics
Thermodynamics (Properties, energy conversion, propulsion)
Heat Transfer
Materials (Metals, inorganic materials, processing)
Dynamics (Particles, rigid bodies, lumped vibrations)
Solid Mechanics (Elasticity, plasticity, strength of materials, continuous vibrations)
Design (Machine design, systems design)
Applied Mathematics (Operational methods, Numerical analysis, probability and statistics, vector and tensor analysis)

A matrix of these disciplines and the missions outlined above, withX's to indicate the expected degree of importance of the discipline to the mission in the near future looks like this:

	Aerospace	Ocean	Soc-Tech	Industry	Military
Fluids	XXX	XXX	X	XX	XX
Thermo	XXX	XXX	X	XX	XX
Heat	XXX	X	-	XX	X
Materials	XXX	XXX	X	XXX	XX
Solid Mech	XXX	XXX	-	XX	X
Machine Design	X	XX	X	XXX	XX
Systems	XXX	XXX	XXX	XXX	XXX
Math	XXX	XXX	XX	XX	XX
Dynamics	XXX	XX	-	XX	XX

Though one can argue with the number of X's in specific places, I think it is clear that Mechanical Engineering is important in aerospace, ocean engineering, and in industry for the future, perhaps even in that order. The importance of systems design, materials, and mathematics is also apparent. I believe these things are important not onlyto our research planning but also to our curriculum designing.

In summary, most of the subject matter disciplines that make up Mechanical Engineering can expect growth and change in conjunction with the missions in which they participate. New areas of mathematics and systems should enter and grow also in conjunction with the missions which are anticipated.

Departmental Program Objectives

The importance of enrollment estimates, both graduates and undergraduates, should be noted for the intimate way they effect planning of new programs. New programs can be expected to increase enrollment if they are appropriately conceived, but the new program cannot be initiated until there is sufficient size in the existing situation to make the start. At a University, we are not able to have much effect on undergraduates enrollment in a five year period because we have four years of students always in the pipeline. We can do more at the graduate levels, but much depends upon external conditions, such as levels of State support and the availability of research funds in Washington. Therefore the programs listed below are not geared to a timetable but are listed as objectives to be carried out as circumstances permit.

1. A well established PhD program in Mechanical Engineering, including research support for graduate faculty and a satisfactory number and quality of students. Program should make available research opportunities for students in fluid-aero-gas dynamics, in heat transfer, in energy conversion and propulsion, in materials and materials processing, and in some areas of mechanics and dynamics. The program should also include graduate level courses in design of mechanical engineering systems.

2. A revised undergraduate program in both Mechanical and Aerospace Engineering. This should have reduced number of credit-hours and a reduced number of courses per semester. The value of far reaching interdisciplinary course sequences at the undergraduate is doubtful. As a Department we should have considerably more influence on and participation in the mechanics work, though we are more interested in the dynamics protion of this than in the staics and solid mechanics. We expect to consolidate our laboratory courses into a single three or four credit course, though other courses would continue to have demonstration laboratories associated with them. The flexibility of electives in the senior year is considered important so that students can better prepare for graduate school or work and for aerospace, ocean, social-technical, or industry. The new program should contain key courses in mechanical and aerospace systems design and new attention to mathematics, especially numerical analysis and probability.

3. A PhD program in Aerospace Engineering.

4. An undergraduate degree program in Metallurgy and Materials Processing and a PhD program in the same area. This will begin with a materials option within the Department in connection with our curriculum revision. It is our hope that this option will thrive and grow to achieve program and degree status on its own or in conjunction with the polymer work. There are serious questions about whether the areas of organic and inorganic materials are sufficiently compatible for merger, but these are best worked out by the subject matter experts. I feel strongly, however, that metallurgy, inorganic materials, and materials processing is far too important and much too general a discipline not to have significant identity within the school. My objective is to build it and give it as much autonomy as circumstances will allow. I think the School should eventually have a Department of Materials Science and Engineering which has Metallurgy and inorganic materials as one of its strong points.

5. A program of bio-engineering where the engineering disciplines are heat tranfer and fluid mechanics. There are analogous groups in bio-mechanics at Wayne State and bio-electronics at Iowa. No group has yet collected in what might be called bio-thermal engineering, though there are several isolated workers.

A description of Departmental objectives in terms of programs is incomplete without also a discussion of the future in terms of the disciplines. In view of our existing strengths, I think we should plan an expansion and emphasis of the fluid-aero-gas dynamics area. We should also plan expansion as noted above in materials. Next I think we should expand our work in energy conversion and propulsion. Our work in dynamics and mechanics needs to increased to the point where we have adequate coverage and representation in the area, though emphasis in the sense that fluids and thermodynamics is to be emphasized is not implied. In design, we must develop and emphasize systems design, including control of mechanical engineering systems, optimization, decision theory, etc. We should have solid heat transfer coverage but I do not think this area is fruitful for emphasis per se. There is much heat transfer work in fluids, in energy conversion, and in the proposed bio-thermal area and I think we should stress it in these contexts rather than try to build a large heat transfer group. We want to keep our machine design coverage, especially at the undergraduate level. It is an extremely important activity that should be available in quality for those students who want it, and I expect this to continue to be a significant number. In the laboratory I think we should emphasize modern instrumentation, the fundamentals of measuremnts and measurement systems and the theory of experimentation, the latter via real measurement projects. We have existing strength in this area on which to build, also.

A special word should be said about the systems area. We have plans for courses at the graduate and undergraduate level in mechanical and aerospace systems design. Especially at the graduate level, I think there may be opportunities here for interdisciplinary work. The problems should not be underestimated, however. There are many different kinds of systems and several different approaches to the area. We would be very willing to work with others to see what common interests result. It seems to me that this is best begun on the graduate level.

In ocean engineering, we are interested in participating where our subject matter areas are involved.

Departmental Organization

My plans for organization of the Department during the coming period of growth, development, and change are still in the formative stage. Some reasonably certain conclusions have been reached, however, on the general approach that we should follow.

First, in addition to more and better secretarial assistance, I think that the Department is large enough for an Administrative Assistant part time. This will also allow me more time for a small teaching and research contribution to the Department.

Second, I think we need to assign responsibility to individual faculty members for development of certain laboratory areas. Their work in this regard would be coordinated by a Director of Mechanical Engineering Laboratories. We might form area committees, with the Chairmen being primarily responsible for the area laboratory in terms of providing equipment for research and instruction, allocating space, scheduling specialized equipment, and providing advice and assistance as appropriate to researchers. Any area committee could agree to function as a group of individuals on quite separate projects or they might agree to concentrate their efforts in a common special sub-area. The areas in which I think we might have such committees and laboratories are fluid mechanics (perhaps sub-divided into supersonic and sub-sonic), heat transfer, thermodynamics (perhaps divided also into propulsion and energy conversion), materials, (sub-divided into metallurgy, materials testing, and materials processing), dynamics, and systems. (The last two may be combined.) There would also, of course, be an instrumentation amd measurements laboratory.

For organization of Departmental activities other than laboratories, I think we will want the following:

Graduate Committee: to administer graduate program and recruit graduate students.

Undergraduate Committee: to continually study and update the undergraduate program, to counsel undergraduates, and to administer program. Where we have several programs, such as ME, Aerospace, Materials, and Coop, sub-committees would be formed.

Publicity Committee: to provide literature on Departmental programs and to improve our relations with the public and with industry.

Personnel Committee: to advise the Head on new appointments, pay, and promotion.

Except for special short term ad hoc committees, I doubt that more committees are needed. We would expect to provide representation to School committees as appropriate. (The library is an example.)

I would expect that faculty representation on the above committees would be more or less on a rotational basis(more on Undergraduate Committee and less on Personnel Committee) and

that appointments would be made by the Head.

One of my concerns is that we might become compartmentalized, especially as a result of the proposed laboratory organization. I also don't want to become over-committeeized. The thing that I am trying to optimize is faculty time and energy spent on teaching and research. We also must avoid the rigidity that would come if, for example, laboratory area committee Chairmen came to think of their labs or subject matter area as being "owned" by them. Appointments would likely be for specified periods to aid in this problem.

It is my hope to formulate the above tentative plans more fully in the next several months so that the proposed new organization can be announced this May and begin next September at the latest.

Conclusion

Engineering activity based upon Mechaical Engineering disciplines will likely grow and become more meaningful in the future. With missions in space, in the ocean, in the social-technical area, and in a changing industry situation, the disciplines of fluid mechanics, heat transfer, thermodynamics, materials and materials processing, laboratory dynamics, solid mechanics, machine design, systems design, and applied mathematics should have at least adequate competence in the Department. We would expect our metallurgy and materials work to grow and perhaps spin off on its own or in conjunction with others. We expect to try to emphasize fluid mechanics as a discipline, with heat transfer as an important corollary in certain areas, and with thermodynamics (conceived as propulsion and energy conversion) also in line for additional emphasis. We think that systems design is extremely important to Mechanical Engineering and we hope to be able to develop this with graduate and undergraduate coursework as soon as possible. This, we expect, may parallel plans in other Departments. In addition to consolidating and strenghtening our graduate and undergraduate programs in Mechanical Engineering, we propose new PhD degree work in Aerospace and more specific identification for the expanding(hopefully) group in metallurgy and materials. A bio-thermal program is also proposed. We also plan more formal organization of our laboratories along subject matter lines within the Department. In this connection, ~~[illegible]~~ though some duplication is probably inevitable, it may be possible for some laboratories to be developed either at the School level or by inter-Departmental committees and we stand ready to try to cooperate wherever this seems appropriate.

Respectfully submitted,

Jack

John R. Dixon

cc: Engineering Deans
Engineering Departmant Heads
Mechanical Engineering Faculty

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From Dr. Richard L. Trumpwell, Head Date January 17, 1967

To Dean K. G. Picha

Subject Department Development Plan

In answer to your memo of August 29, 1966 and your later comments, the following is a ten year overall department development program for the Department of Industrial Engineering. It is in general terms and is based on comments from our faculty and my own views on the matter. There are three parts, Brief History, Present Status (A critical examination) and Projections.

PART I BRIEF HISTORY

The goals stated by the administration for the Industrial Engineering Program when it was established in the Spring of 1965 were:

1. Recruit additional faculty.
2. Develop a Ph.D. Program.
3. Obtain departmental status.

These goals were completed in the fall of 1966 with approval of department status and the Ph.D. program. Four faculty members have been added and graduate student enrollment has doubled. However, we are presently in a period of leveling out or regrouping after fairly rapid development.

PART II PRESENT STATUS - A critical Examination

1. Faculty: Five of the six faculty members in Industrial Engineering hold Ph.D.'s and are all well qualified in their respective areas of interest. The faculty members have been described as young and dynamic. However, even though all are engaged in research, only two of them have outside supported grants awarded directly to them. The major interests of the faculty are essentially in the areas of operations research, and manufacturing and production.

More faculty members are needed to develop new areas and to strengthen existing ones.

2. Summer Program: The first industrial engineering summer school courses were offered in the summer of 1966. These courses were well accepted and the number of presently scheduled I.E. summer courses for 1967 is approximately twice that of 1966. Only one course had to be cancelled because of lack of enrollment in 1966. We are essentially offering sufficient courses to permit full time graduate student attendance during the summer sessions.

Additional faculty research support is needed for the summer and arrangements must be made for advising graduate students on their thesis activities if they are not related directly to the research activity of the faculty member.

3. Students: We presently have 54 undergraduate students and 23 graduate students. This represents a doubling of the graduate student enrollment of the 1965-1966 academic year. More graduate students are expected to enter this spring. Undergraduate enrollment has been only gradually increasing. The most recent group of freshmen indicating thier major program, however, was up approximately 33% over previous years.

The present junior and sophomore I.E. classes have grade point averages higher than most industrial engineering students in the past and there have been several inquiries by students with high cumulative averages. This is significant in terms of the quality of the students entering the program.

Additional financial support is needed for graduate students. The present group is supported by only two graduate assistantships and some funds from research grants.

4. Curriculum: The undergraduate curriculum can be ranked as good to very good and has excellent acceptance in industry. The Kodak Corporation comes back each year and hires 3 or 4 of our graduates. We have had many favorable comments from industry about our undergraduate students and their preparation.

The undergraduate curriculum was approved by ECPD but it was recommended that the undergraduate curriculum be carefully reviewed and changed where appropriate. This review is currently under way.

The graduate program is very good to excellent but lacks depth in terms of faculty and the experience gained from offering courses over a longer period of time. Most graduate courses of the 700 level are being offered for the first time and a considerable amount of ironing out or smoothing out of the curriculum is necessary.

5. Research: There are only two outside supported research studies under way in the department. Two of the faculty members are however associated with an outside research study and in fact are co-principal investigators. However, the funds are handled through another organization, and as such the grant was not awarded to the University of Massachusetts.

6. Laboratories: Present laboratory facilities are minimal but are good in the tracitional industrial engineering areas. A few special graduate study projects have been developed in these laboratories and additional ones are planned.

7. Operational facilities: The present office arrangement has caused considerable difficulty in maintaining smooth operations for both the department head and the department itself. It is expected that this situation will be rectified shortly and a more effective operation can be maintained.

PART III PROJECTIONS

It is generally accepted that enrollment in engineering will at least double in the next ten years. However, in addition to this normal amount of growth if the Department of Industrial Engineering at the University of Massachusetts is to become a significant department nationally it must also catch up with the currently leading departments. Present first rate departments have approximately 15 to 20 faculty members on their staff. The comments provided below take into consideration both the 10 year doubling factor and the present size of the first rate departments.

The following table provides an estimate of the desired growth for the department:

	FY 67	FY68	FY69	FY70	FY71	FY76
Undergraduate Students	54	70	95	115	130	250
Graduate Students	24	28	44	60	68	94
Faculty	6	7	11	15	17	26

The above figures for faculty include 4 faculty positions under a proposed NSF grant. It is possible that additional positions may be obtained from training grants, however these are not included in the above figures. A 4 to 1 graduate student-faculty ratio and a 10 to 1 undergraduate student-faculty ratio has been used to project the approximate number of students.

AREAS OF SPECIALIZATION

The following are the major areas in which the department wishes to specialize:

1. Operations Research.
2. Information Handling and Data Processing Systems.
3. Human Factors.
4. Manufacturing and Production Systems.
5. Systems Engineering and Analysis.

It should be noted that some of these major areas are rather extensive and many minor areas or sub-programs could exist. For example, under Manufacturing and Production Systems an extensive safety program could be developed as well as in other areas such as maintenance, engineering, and production engineering. The systems engineering area would probably entail many interdisciplinary courses and the program would utilize faculty members from other departments. It is felt that systems engineering is more appropriate for administration in the Department of Industrial Engineering than in other departments although it cannot be considered to be industrial engineering as such.

Another minor area might be in the area of hospital systems and research. This would indicate a rather extensive program for training industrial engineers in the application of industrial engineering to hospital systems. Other minor areas such as water resources systems analysis and solid waste systems analysis could also be develop .

It will be necessary, however, to maintain a balance between the applied aspects and the theoretical aspects of Industrial Engineering. We must be able to train our graduates for entry into industry and also the academic world. Even our Ph.D.graduates must be permitted sufficient flexibility in their programs to pursue either academic goals or corporate planning positions in the operations research area within a large company. In the applied area it is also necessary for the department to be capable of providing graduates who can work at the operating level within industry.

SUMMARY

In summary, the next five of six years will be very critical in terms of the growth necessary for the eventual development of the department. It will be necessary to take rather large steps initially and to then level out and carefully develop the overall department structure. This leveling out and careful development would probably occur during the period FY72 through FY76. The eventual department size would probably not be larger than 30 faculty members and if this size is reached would be broken down into smaller groups for better organizational effectiveness.

The major problem areas at the moment are the recruiting of additional faculty, graduate students, and the development of new areas within the program. The number of graduate students is a function of financial support which in turn is somewhat of a function of the faculty and their research support. It must be noted that the entire picture represents somewhat of a redundant situation in that faculty members require good graduate students and good graduate students will not enter a program without good faculty. However, we will place our primary emphasis on efforts to recruit good faculty members.

Richard W. Trueswell, Head
Department of Industrial Engineering

RWT/mas

UNIVERSITY OF MASSACHUSETTS
College of Arts and Sciences

A N N U A L R E P O R T

Period Covered: July 1, 1966 through June 30, 1967

Submitted to: President John W. Lederle

Submitted by: I. Moyer Hunsberger

I. Moyer Hunsberger
Dean, College of Arts and Sciences
August 15, 1967

PREFACE

This report is intended to provide an overview of all important aspects of this College. For the convenience of the reader, all Tables containing statistical information are collected together in an Appendix which follows the body of this report.

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New Faculty Appointments for 1967-68 97 - 114

I. BUDGET ALLOCATIONS

Account	FY 1965	FY 1966	FY 1967
03[1]	$ 88,100	$ 115,462	$ 162,262
10	17,775	23,775	34,410
11	1,000	1,000	4,100
12	20,955	20,800	38,200
13	131,725	186,425	200,600
14[2]	8,500	13,000	13,950
15	143,825[3]	205,083	248,200
16	8,000	9,750	15,000
TOTALS	$ 449,880[3]	$ 575,295	$ 716,722
Salaries (01, 02)	$4,103,957	$5,424,364	$6,375,512
(03)	89,000	139,641	81,138
Grand Totals	$4,642,837	$6,139,300	$7,173,372
Library	$ 206,500[4]	See footnote (5)	

Footnotes

(1) Does not include faculty salaries paid from Account 03.

(2) Does not include allocations for telephone charges.

(3) Does not include $116,725 specially allocated from Federal funds.

(4) Includes $145,000 in Bankhead-Jones money.

(5) No allocations made to the College or to individual departments. Instead the Library honored virtually all requests for books.

II. ORGANIZATIONAL CHARTS

A. DEPARTMENTS AND ADMINISTRATIVE UNITS BY (UNOFFICIAL) DIVISIONS

Dean's Office

Fine and Performing Arts

Art
Music
Speech

Humanities

English
Germanic Langs. & Literature
History
Philosophy
Romance Langs.
Slavic Langs. & Literature

Social Sciences

Economics
Government[1]
Psychology
Sociology-Anthropology

Biological Sciences

Botany
Microbiology
Zoology

Physical Sciences

Biochemistry
Chemistry
Geology (Geography)
Physics & Astronomy[2]

Mathematics and Statistics

Mathematics
Statistics[3]

Interdepartmental Units

Asian Studies
Comparative Literature

Footnotes

(1) The Bureau of Government Research is a part of the Government Department.

(2) The Astronomy program has a Chairman who is also Chairman of the Four-College Department.

(3) Statistics operates as a separate unit without departmental status.

B. DEGREES, MAJORS AND OTHER PROGRAMS OF STUDY

Majors for Bachelor of Arts Degree

Anthropology
Art
Astronomy[1]
Biochemistry[2]
Botany
Chemistry
Classics[1]
Economics
English
French
Geology
Government
History
Journalistic Studies
Mathematics
Microbiology
Music
Philosophy
Physics
Pre-dental Studies
Pre-medical Studies
Pre-veterinary Studies
Psychology
Russian
Sociology
Spanish
Speech
Zoology

Majors for Bachelor of Science Degree

Astronomy[1]
Biochemistry[2]
Botany
Chemistry
Geology
Mathematics
Microbiology
Physics
Pre-dental Studies
Pre-medical Studies
Pre-veterinary Studies
Psychology
Zoology

Bachelor of Fine Arts[2]

Art

Bachelor of Music[2]

Music

Programs without Major

Asian Studies
Chinese
Comparative Literature
Danish
Geography
Italian
Japanese
Polish
Portuguese
Statistics

Majors for Master of Art or Master of Science

Anthropology
Astronomy[2]
Biochemistry
Botany
Chemistry
Economics
English
French
Geology
German
Government
History
Mathematics
Microbiology
Philosophy
Physics
Psychology
Russian
Sociology
Spanish
Speech
Statistics[2]
Zoology

B. DEGREES, MAJORS AND OTHER PROGRAMS OF STUDY (continued)

Majors for Master of Fine Arts

Art
English
Speech

Majors for Doctor of Philosophy

Astronomy[2]
Biochemistry
Botany
Chemistry
Economics
English
French
Geology
German
Government
History
Mathematics
Microbiology
Philosophy
Physics
Psychology
Sociology
Spanish
Zoology

Footnotes

(1) Four-College undergraduate degree program.

(2) Effective September of 1967.

III. PERSONNEL

A. PROFESSIONAL PERSONNEL

Table 1 presents data on the number of professional positions by rank, which were filled for the fall semester of each of the past three years.

The number of administrative positions this year remained unchanged from September, 1965. The number of faculty positions filled, on the other hand, show increments of 82 1/4 and 81, respectively, between fall 1964 and 1966. Thus, the number of filled faculty positions in 1964 has been increased by 44%! Since these figures represent only net additions to the faculty, the number of new faces is very much larger because of replacements of faculty members who resigned or were terminated. The proportion of the faculty in the upper two ranks remains near 39% although the University staffing pattern calls for 45% in these ranks. The progressive decrease in the number of instructors and corresponding increase in the number of assistant professors noted in my report last year is again evident; it unquestionably reflects a progressive increase in the proportion of the faculty who have completed their doctorates.

I am gratified to note the increase (from 3 to 7) in the number of staff assistants. However, with expanding departments and the considerable effort expended by the department heads in the recruitment of a distinguished faculty this increase still represents only a step in the right direction.

The number of Teaching Assistantships for September, 1966 was only twelve more than for the preceeding year (353 vs. 341); the increment for 1965 had been 53 (341 vs. 288). The increase of $200 in the average stipend was essential, particularly in some of the sciences, if we were to compete successfully with other quality graduate schools, but there is a clear need for the allocation of additional funds for increased numbers of these "junior instructors". I refer to them as "junior instructors" because, indeed, many of them would hold appointments at the rank of instructor at other, smaller colleges were they not teaching assistants here.

The number of postdoctoral research associates (29), is more than twice that of two years ago (13), and Physics has joined the departments of Chemistry, Sociology-Anthropology, and Zoology in sponsoring these individuals. The greatest increase occurred in Zoology (Table 1).

Table 2 presents a breakdown of the faculty positions which were filled each of the past three years by division, department, and rank.

As indicated above, the number of filled faculty positions has increased 44% over the 1964 figure. This table reveals that each division and department has participated almost equally in this growth with two notable exceptions.

The increment of 22 1/2 positions in the Fine Arts represents an increase of 60%. Each of the three departments in this division grew at a greater rate than the College as a whole (Art 64%, Music 75%, and Speech 52%). Growth in this area is particularly gratifying; no liberal arts college or university can be considered distinguished prior to its development of a broad program in the fine arts.

The social sciences have grown significantly, but the increment is somewhat less than that of the other divisions. The 24 additional, filled positions since 1964 represents an increase of 39%.

Special note should be taken of the growth of the Department of Physics-Astronomy. As two separate departments in 1964 they had a faculty of 16; in 1966 the number had nearly doubled, reaching a total of 31. Particularly successful recruiting by this department during the present year insures its continued growth both in size and stature.

As of September, 1966, this College had four departments with more than 40 faculty (English, 74; Mathematics, 48; Romance Languages, 44; and History, 42). Only three departments had ten or fewer faculty (Philosophy, 10; Microbiology, 8; Biochemistry, 5). Single professors directed each of the interdisciplinary programs in the College, Asian Studies and Comparative Literature.

It is a pleasure to note that the combination of successful recruiting at the higher ranks and promotions to the rank of associate professor have increased the number of departments in which the number of positions in the top two ranks equals or slightly exceeds the University pattern of 45% at these ranks. The departments are: Biochemistry (80%), Botany (52%), Geology-Geography (54%), Government, including the Bureau of Government Research (50%), Philosophy (50%), Physics (47%), Romance Languages (45%), and Zoology (50%). On the other hand, instructors and lecturers constitute approximately 40% of the staff in five departments, namely: Art (39%), Economics (41%), German (40%), Slavic Languages (50%), and Speech (39%). Clearly there is a continuing necessity for intensive recruiting at the higher ranks.

Table 3 summarizes professional personnel actions taken during the past three years. During the present year, as in 1964-65, approximately six percent of the faculty were promoted, eight percent resigned, or otherwise terminated their appointment, and 70% were granted merit increases.

The number of sabbatical leaves granted for the next academic year is reduced to 14 from 21 and 27, respectively, in the two preceding years. The small number is largely a consequence of the rapid growth of the University and the relatively small percent of the faculty who are eligible for such leaves. It is probably also indicative, however, of the need to review present policy, particularly as regards stipends during the sabbatical leaves. It may seem hardly worthwhile to relocate one's center of study for a single semester, yet half salary during an entire academic year may be economically impossible. This problem, which is not unique to this University, is most acute for the non-science faculty, who in general find it difficult to obtain outside financial support for a sabbatical year.

B. ASSOCIATE AND ASSISTANT DEANS

The delegation of various responsibilities of the Dean's Office which are not directly concerned with faculty recruitment and development was continued, and the division of responsibilities is detailed in the following pages.

Associate Dean Wagner and Assistant Dean Rollason served full time in the Dean's Office. Assistant Deans Leonta Horrigan (English), Jay Savereid (Speech), and Gerald McFarland (History), served the Dean's Office on a "half-time" basis and have the classes of '67, '68 and '70, respectively, as the primary focus of their attention. Dean Rollason served the class of '69 in addition to his other responsibilities.

Dean Horrigan completed three years of service in June with the graduation of the class of '67, and her conscientious performance of these duties is gratefully noted.

Assistant Dean Rollason, with experience, has been even more helpful with the budgetary and accounting aspects of the College's affairs, especially in the screening of grant proposals and of non-professional appointments.

Associate Dean Wagner has continued to cope successfully with the continuing problems of fitting twenty-three growing departments into more slowly increasing space, along with keeping track of curricular developments and various other aspects of student affairs.

DUTIES OF ASSOCIATE DEAN ROBERT W. WAGNER (1966-67)

I. Buildings and Space

(a) Plans for new buildings: Chairman of Building Committees for Bartlett East; Addition to Machmer Hall; Bartlett West; Fine Arts; Morrill, Section V.

(b) Renovation of old buildings.
(c) Assignment of space to departments.
(d) Forecasts of space needs.
(e) Supervision of Project Maintenance and work requests.
(f) Liaison with Provost's Planning Officer.

II. Curriculum

(a) Chairman of College Curriculum Committee.
(b) New courses and programs.
(c) Scheduling problems, including 4-college courses.
(d) Catalogue copy.
(e) Course enrollment summaries.
(f) Grading practices.

III. Academic Affairs of Students

(a) Evaluation of transcripts of transfer students and returning students.

(b) Adviser to unclassified students.
(c) Liaison with Assistant Deans.
(d) Coordination of Chief Advisers in all departments.
(e) Student Faculty Nights.
(f) Grade changes.
(g) Recommendations for students who have graduated or left college.

(h) Summer programs for incoming College of Arts and Sciences freshmen.

IV. Miscellaneous

(a) Administrative supervision of teachers not assigned to departments, e.g. Chinese and Japanese.

(b) Arrangements for meetings of College Faculty and of College Executive Committee.

(c) Recorder for College Executive Committee.
(d) Assist Dean with committee appointments, correspondence.
(e) Represent Dean at various meetings.
(f) Act for Dean when Dean is off campus.

DUTIES OF ASSISTANT DEAN H. DUNCAN ROLLASON (1966-67)

I. Academic Affairs of Students

(a) Academic Dean for the Class of 1969
(b) Academic Dean for students in all classes, except those seniors who did not graduate in June, during the summer.
(c) Assist in the Summer Counseling Program.

II. Academic Planning

(a) College Curriculum Committee member.
(b) Curriculum Study Committee consultant.
(c) Freiburg Committee Chairman.
(d) Summer School Committee member.

III. Non-professional Personnel

(a) Review with the Dean the requirements of the College.
(b) Review all appointments.

IV. Research Grants

(a) Review all applications submitted by members of the faculty to the University Research Council and to outside agencies.
(b) Approve all appointments under Research Grants.

V. College Budget

(a) Assist Dean in preparation of the budget and the allocation of funds appropriated to the College.
(b) Review of expenditures by Departments as reported by the Treasurer's Office.

VI. Graduate Teaching Assistants

(a) Review qualifications of all persons recommended for appointment.

VII. Miscellaneous

(a) Secretary for meetings of the Heads of Departments.
(b) Review minutes of Department Meetings.
(c) Assist the Dean in the preparation of the Annual Report.
(d) Edit Handbook for New Faculty.

COMPOSITE DUTIES OF HALF-TIME ASSISTANT DEANS (1966-67)

1. Advice to students regarding:

   (a) Transfer into College of Arts and Sciences.
   (b) Transfer out of College of Arts and Sciences and out of the University.
   (c) Dismissals, reinstatements, readmissions.
   (d) Study at other United States colleges.
   (e) Study abroad.
   (f) Exceptions to academic regulations: Graduation requirements of College of Arts and Sciences, withdrawal from courses, load requirements.
   (g) Choice of major and other more general academic advising.

2. Investigate and decide on applications for exceptions to academic regulations.

3. Interview students (often with their parents) who have been dismissed from the University for academic deficiency; write recommendations to the Board of Admissions and Records.

4. Supervise record-keeping for all students in the College of Arts and Sciences.

5. Administer University academic regulations, especially those involving adding and dropping of courses.

6. Administer College academic regulations and develop improved procedures and forms.

7. Evaluate transfer courses, counsel transfer students, and investigate errors and omissions in their records.

8. Occasional investigation of student grievances against faculty.

9. Untangle problems created by misadvising, errors in records, etc.

10. Approve special programs: course overloads, study abroad, etc.

11. Revise College of Arts and Sciences check-list of graduation requirements to keep it up-to-date.

12. Member of College of Arts and Sciences Curriculum Committee.

13. Consultant to College of Arts and Sciences Curriculum Study Committee.

14. Send letters of commendation to students for jobs well done.

15. Study College problems with a view to initiating programs and procedures such as:

    (a) Departmental Chief Advisers Program.
    (b) Choice of major programs.
    (c) Student-Faculty Evenings.
    (d) Dean's Book Awards.
    (e) Deans' meetings with students.
    (f) College and departmental honors programs.
    (g) Teaching of required courses.
    (h) Special cultural programs for Freshmen Orientation Week.
    (i) Relations of College of Arts and Sciences with Registrar, Deans of Students, etc.
    (j) Relations with Collegian.

16. Participate in University association of assistant deans to discuss common problems.

17. Maintain liaison with departmental chief advisers.

18. Keep an ear to the ground so as to be able to alert proper people to potential academic problems.

19. Attend teas, luncheons, coffee-hours, etc., especially on invitation of academic honor societies.

C. NON-PROFESSIONAL PERSONNEL

Table 3A presents a three-year breakdown of both secretarial positions (SP) and technical positions (TP) by rank.

Table 3B lists FP/SP ratios, as of the fall of 1966, for each department and division, as well as the highest ranking secretarial position in each department.

Table 3C reveals that the ratio of faculty positions to secretarial positions declined only one-tenth (from 7.3 to 7.2); it is distressing to note that the decline, which was first noted last year after several years of ascending ratios, has remained so nearly unchanged. It is, however, a pleasure to recognize the fact that five of the ten new secretarial positions were at the grade of senior clerk, stenographer, and principal clerk. There are still two departments in the College with more than 30 faculty positions in each of which the highest ranking position is that of senior clerk, stenographer and two others with 20 and 10 faculty positions, respectively, in which the highest ranking position is senior clerk, typist. Junior clerk, stenographers hold the highest position in three of the smaller departments. With an ever-increasing proportion of our faculty actively involved in research and other professional activities and an increasing number of graduate teaching assistants who can legitimately expect some secretarial assistance in the typing of tests and other material for classroom use, the need for considerable additional secretarial assistance is apparent. A FP/SP ratio of 9 or higher still exists in three departments in the College. Both faculty productivity and morale and the recruitment of superior faculty will suffer unless the ratio of faculty to secretaries continues to decline rapidly toward our present goal of 5 to 1.

The allocation of eight new technical positions to the College for each of the past two years is heartening. State-supported technical positions are absolutely mandatory if our faculty is to keep abreast of the times in its teaching and to be encouraged and supported in its research. A ratio of one technical position for each 10 faculty positions is a goal which should be attained in the next few years.

IV. STUDENTS

As in recent years, this report contains a ten year summary of the University enrollment on the Amherst campus (Tables 4 and 5). Table 4 gives the exact figures and Table 5 repeats it with numbers replaced by percentages. The College of Arts and Sciences and the School of Engineering are the only units showing a decrease in the share of undergraduates. Some of the increases in the other schools are directly related to the differential policy on freshman admissions.

The actual work of the College is presented in Table 6 which summarizes the teaching effort by department and division. The percentage increase in student credit hours from last year was 16% although the University enrollment increased only 15% and the undergraduate enrollment increased only 14%. A comparison with last year's figures reveals that the division of Fine and Performing Arts had the largest relative increase (nearly 40%) and that the contribution of this Division rose from 6.8% to 8.2% of the College total. (See also Table 8.)

Another noteworthy feature appears in the thesis columns of Table 6, namely, that only one third of the graduate theses reported are for Master's degrees.

The final column reflects the shifts in teaching effort for the second semester; it appears that the large decreases are in those disciplines in which the large introductory courses are year courses with a sequential relationship.

Tables 7 and 8 should be examined together. Table 7 shows a historical breakdown of the students by major whereas table 8 shows the FTE (Full Time Equivalent) based on the student credit hours taught.

The information from Tables 2 and 8 is combined in Table 9 which shows the student-faculty ratio, both with and without taking the Graduate Teaching Assistants into account. The Teaching Assistant Equivalent is an approximation obtained by the rule that three teaching assistantships are equivalent to 1 F.T.E. faculty position, and an assistantship results from an amount of money ($2400) available as an average stipend. A particular effort will be made to reduce the ratio in those few departments in which it is very high.

The history of the student faculty ratio for the college is presented below:

1962-63	1963-64	1964-65	1965-66	1966-67
18.6	18.1	18.8	17.2	17.2
			18.2	18.7

The ratios in the first line are computed consistently; 15 student credit hours equals one F.T.E. student. Starting with '65-66 the University used 8 student credit hours as one F.T.E. graduate student; the official ratios using this new definition appear on the second line for the last two years. It is regrettable that this ratio cannot be brought closer to the legislative figure of 15.

A summary of degrees awarded by type and level is presented in Table 10. It is gratifying to note the growing list of departments actually awarding doctorates.

Table 11 shows the percentage of students with cumulative averages equal to or exceeding selected levels. It is included in this report because there will be increasing interest in student averages as we move toward the 2.0 requirement for graduation. These relative standings use data of June 1967, but a check with past years shows almost no change. Note the decline in the percentage of each class with the highest and the lowest averages as one moves from freshmen to seniors. The spread between the highest and the lowest cumulative averages decreases in going from the freshmen (Class of 1970) to the seniors (Class of 1967). The percentage of each class whose cumulative average falls below 2.0 decreases, partially as a consequence of the dismissal of those with very poor records from 28% of the Class of 1970 to 14% of the Class of 1967.

V. FACULTY AND PUBLICATIONS, RESEARCH PROJECTS, AND OTHER PROFESSIONAL ACTIVITIES

A. PUBLICATIONS

The faculty is increasingly active in research and other scholarly activity. Publications have emanated from every department in the College.

The books and monographs, three reprintings of previously published books, two translations, and three musical compositions authored or edited by members of the faculty during the past academic year are listed in Table 12 according to division, department and author. Six of the books were published by the Presses of Columbia, Harvard, Massachusetts, Rutgers, Vanderbilt, and Yale Universities.

In addition to books and manuscripts more than 400 articles and 68 book reviews were published by members of the faculty in each of the divisions of the College. As might be anticipated, nearly half of the articles emanated from the laboratories of the physical and biological scientists, though the faculty in both the humanities and the social sciences contributed significantly to the total of scholarly articles published during the year. Eighteen popular articles, two short stories and chapters in three books are included in this summary of publications.

Several Department Heads commented favorably on the quality of the publications of their faculty. Many of our faculty are assistant professors who are just establishing a research program. I think that the College can take pride in this aspect of the scholarly work of its faculty.

B. SPONSORED RESEARCH AND SERVICE PROJECTS

The face value of grants in effect during the fiscal year totaled nearly two and one half million dollars ($2,438,148.). The number of grants and their annual value is presented by divisions and departments in Table 13. The number of awards and the total value have increased approximately 10% and 5%, respectively, from last year and represent a five-fold increase since the start of this decade.

The University Graduate Research Council awarded 109 grants with a total value of $72,755 to members of our faculty during the period of this report; these are included in the data in Table 13. Faculty in the Arts and Humanities received 30% of these awards and 24% of these funds. Further expansion of this program of University support for research, particularly that in the Arts and Humanities, should be fostered.

All grants to the Physical Sciences exceeded one million dollars. Awards totaling slightly more than $700,000 in annual value were made to the Biological Sciences and nearly $400,000 to the Social Sciences. Thanks largely to the NDEA support of a summer institute in History the grants to the Humanities reaches nearly $180,000. Awards of $50,000 were made to the Fine and Performing Arts and of a similar amount to Mathematics and Statistics.

Awards to the Department of Chemistry exceeded $550,000 and those to the Department of Physics and Astronomy exceeded $400,000. Three other departments received awards in excess of $200,000, namely Zoology ($297,000), Psychology ($280,000) and Botany ($257,000). The award of 14 grants with a value for the year of $160,000 to the Department of Microbiology and 8 grants with a value of $104,000 to the Department of Biochemistry represent the largest awards per member of the faculty.

C. OTHER PROFESSIONAL ACTIVITIES OF THE FACULTY

To list all of the other professional activities of the faculty would require numerous pages and would not be very useful, yet a meaningful summary is nearly impossible because of the diversity of these activities. Members of the Art Department have exhibited locally, nationally, and internationally, and their works have been acquired for both public and private collections. Similarly the musicians have presented concerts and traveled extensively throughout the state serving as clinicians and adjudicators at various schools. They have accepted invitations as guest conductors and have had their compositions performed. The most widely publicized achievement made by any member of the faculty was Professor Jules Piccus' (Romance Languages) discovery of some Leonardo da Vinci manuscripts in the National Library at Madrid.

Those members of the faculty who are editors or serve on the editorial boards of scholarly publications and those who held offices in professional societies, etc., are listed in Table 14.

It will be noted from inspection of the table that 24 members of the faculty are editors or members of the editorial boards of one or more publications in their fields. Seven scientists are members of the advisory boards of federal support programs (NSF, NASA, National Research Council), and one is a member of the Governor's Council on Conservation.

VI. MAJOR ACCOMPLISHMENTS AND SPECIAL PROGRAMS

A. SPACE READJUSTMENTS, SUMMER 1966

The continued expansion of the College and the impending demolition of the Abigail Adams House, in which some office space had been provided for members of the English Department, necessitated the assignment of additional space to the College. Since no new academic buildings had been completed during the year, Arnold House and Berkshire House were converted from dormitories to offices and research space.

Because it was the wish of most of the faculty that departments be fragmented as little as possible, the German and History Departments were moved from Bartlett Hall to Machmer Hall and Arnold House, respectively, thereby providing room in Bartlett for expansion of the English, Romance Languages and Speech Departments. The Department of Mathematics moved from Machmer Hall to Arnold House; this made possible the move of the Department of Philosophy from the School of Business Administration Building into Machmer Hall and the expansion of the Departments of Government and Sociology which already were located in the latter building.

Most of the Psychology Department was located in Bartlett Hall though space for some of their graduate students and research was located in Clark Hall. The newly-acquired space in Berkshire House was assigned to the Psychology Department and the "overflow" from the Art and Botany Departments moved into Clark Hall.

The result of these moves was to bring most departments together, but the ones which were still divided were Art (in seven different buildings), Botany (with graduate assistant overflow in Clark), Chemistry (with graduate assistant overflow in Hasbrouck and Arnold), Music (Old Chapel and the mobile units, with practice rooms in the tower of South College), Psychology (with substantial facilities in the Wysocki and Middlesex Houses), and Speech (with some overflow in the Conservation building).

Some two hundred fifty persons were involved in these moves, and the provision of office furniture for them became somewhat chaotic because of the need to minimize the moving of furniture. The departments which moved fared better than those which remained in the old location.

B. ADMINISTRATIVE CHANGES IN THE COLLEGE

Dr. John M. Maki, who was brought to this campus in September of 1966 to chair the new Asian Studies Program, was appointed Vice-Dean of Arts and Sciences, effective July 1, 1967. As such, he will serve as Dean Hunsberger's deputy in all affairs of the College, but his primary duty will be to assist with faculty personnel matters.

Several changes in the departmental organization of the College became effective on September 1, 1966. A new Department of Biochemistry was established and Dr. Edward W. Westhead, most recently at Dartmouth Medical School, was appointed Acting Head. The former German-Russian Department was split into a Department of Germanic Languages and Literature and a Department of Slavic Languages and Literature. Dr. Wolfgang Paulsen and Dr. Jack A. Posin were recruited from the University of Connecticut and Stanford University, respectively, to become Heads of the two new departments.

Also effective on the above date was the establishment of two new interdisciplinary programs. An Asian Studies Program was instituted under the Chairmanship of Dr. John M. Maki from the University of Washington. Professor T.O. Wilkinson (Sociology) will serve as Acting Chairman of this Program, effective September 1, 1967. A Comparative Literature Program was formalized, and Dr. W. Bernard Fleischmann from the University of Wisconsin in Milwaukee assumed the position of Chairman on February 1, 1967. In addition, the previously enlarged Department of Physics and Astronomy recruited Dr. William M. Irvine from Harvard University to serve as Chairman of the Astronomy Program, effective September 1, 1966. Dr. Irvine was also named Chairman of the Four-College Astronomy Department.

During 1966-67 the search for a new Department Head in Economics again proved fruitless even though Dean Hunsberger joined forces with Professor Morris to attend the Economics meetings in San Francisco in December. Professor Morris will continue to serve as Acting Head during 1967-68.

Professors Howard Brogan and Jack Posin resigned as Heads of the Departments of English and Slavic Languages and Literature, respectively, at the conclusion of the present academic year. Professors Russell K. Alspach and Aron Pressman will serve as Acting Heads of these departments, effective September 1, 1967.

During 1966-67 the College was most fortunate in being able to appoint Dr. M. H. Appley (Graduate Dean and Professor of Psychology at York University in Toronto) as the new Head of Psychology, effective September of 1967, replacing Dr. C. C. Neet.

C. COLLEGE CONSULTANTS

During the period covered by this report Dean Hunsberger, with the consent of the departments involved, brought to campus two groups of consultants to advise him on the future development of the Departments of Psychology and Economics. Each of these groups spent two days on campus and met with the departmental faculty, the Dean, various heads of departments, the Provost, and the President.

The Psychology consulting team, which visited campus on July 10-12, was composed of the following persons:

Kenneth E. Clark, Dean of Arts and Sciences, University of Rochester

Richard L. Solomon, Professor of Psychology, University of Pennsylvania

Stuart W. Cook, Chairman of Psychology, University of Colorado

Carl Pfaffmann, Vice-President, Rockefeller University

The Economics consulting team, which visited campus on December 5-7, was composed of the following persons:

Robert M. Solow, Professor of Economics, M.I.T.

Lawrence R. Klein, University Professor of Economics, University of Pennsylvania

George H. Borts, Chairman of Economics, Brown University

These visits proved so helpful to all concerned that it is planned to continue and to expand this practice. One logical time for such visits obviously is during the early stages of a search for a new department head.

D. VISITS TO OTHER INSTITUTIONS

Dean Hunsberger devoted two weeks of October to two-day visits to each of the following west-coast universities: University of California at San Diego, University of California at Irvine, University of California at Los Angeles, University of California at Santa Barbara, University of California at Berkeley, University of California at Santa Cruz, Stanford University, University of Oregon, and University of Washington (Seattle). On each campus he consulted with the Dean of Arts and Sciences (or other appropriate administrators) as well as with faculty and department heads in some or all of the following departments: English, Economics, Psychology. By comparing notes with other Deans he greatly broadened his perspective and he learned of important new developments on other campuses; in addition, the names of possible candidates for various departmental headships were collected.

E. FACULTY

1. SALARIES

The following two sheets protray the history of faculty salaries in this College for the past 6 years in both tabular and graphical form. The so-called autonomy legislation was passed during the summer of 1962, and the following sheets compare the last pre-autonomy year (1961-62) with the first five post-autonomy years (1962-66).

During this 6-year period the average salary for full professors has increased by about $6,600 and the maximum by about $11,000. Lesser, but substantial, increases have occurred at the lower ranks.

The University now has authorization to appoint up to one percent of the faculty at salaries above the nominal maximum of $24,000.

2. RECRUITMENT

Tables 15 and 16 summarize the results of our recruiting for 1967-68 as of September, 1967. Table 17 summarizes the unfilled positions as of the same date. Recruitment of new faculty was completed earlier in the 1966-67 academic year than ever before in the history of this College. Virtually all 70 of the new positions assigned to the College were filled by the middle of April. For all practical purposes the entire faculty roster was as complete this year by the end of April as it was last year by the end of July. As of mid summer the College had recruited 127 new, full-time faculty; of these, 70 will occupy new positions and 57 will occupy vacancies created by resignation, retirement, etc.. In addition, 8 positions were filled by new, part-time faculty. HENCE, THE TOTAL NUMBER OF NEW FACULTY RECRUITED FOR 1967-68 AMOUNTS TO 135 FULL-TIME EQUIVALENTS (FTE).

It may be informative to summarize the faculty recruiting efforts undertaken by two of our departments (Physics-Astronomy and Economics).

In the process of making 7 new faculty appointments (1 professor, 2 associate professors, and 4 assistant professors) the Department of Physics and Astronomy brought 41 prospective candidates to this campus: 5 from Yale, 3 each from Brookhaven, Bell Labs, and Princeton; 2 each from Harvard, Berkeley, Cornell, MIT, LaJolla; and 1 each from Illinois, NYU, Western Reserve, Northwestern, Johns Hopkins, Pittsburgh, Carnegie Tech, Yeshiva, Wisconsin, Northeastern, CUNY, Minnesota, McGill, U.S. Army, Applied Physics Laboratory, ETH in Zurich, and England. The department also was in correspondence with an additional 100 physicists, of whom 25-40 were realistic possibilities for appointment.

COLLEGE OF ARTS & SCIENCES SALARIES PAID

Professors	Maximum	Median	Minimum	
1961-62	12,896	10,387	8,502	
1962-63	14,144	11,655	9,256	
1963-64	18,111	13,858	12,246	
1964-65	19,713	14,900	13,098	
1965-66	21,000	15,288	11,484	(12,477)
1966-67	24,000	17,000	12,200	(14,200)

Associate Professors	Maximum	Median	Minimum	
1961-62	8,684	8,684	7,124	
1962-63	9,776	9,256	7,748	
1963-64	12,719	10,826	9,739	
1964-65	13,858	11,484	9,939	
1965-66	15,574	11,819	10,168	
1966-67	19,600	13,450	11,000	(11,500)

Assistant Professors	Maximum	Median	Minimum	
1961-62	7,527	7,254	6,981	
1962-63	8,060	7,527	6,435	
1963-64	10,353	8,795	7,880	
1964-65	11,819	9,253	7,467	
1965-66	12,719	9,596	7,508	
1966-67	17,000	10,800	7,800	(8,600)

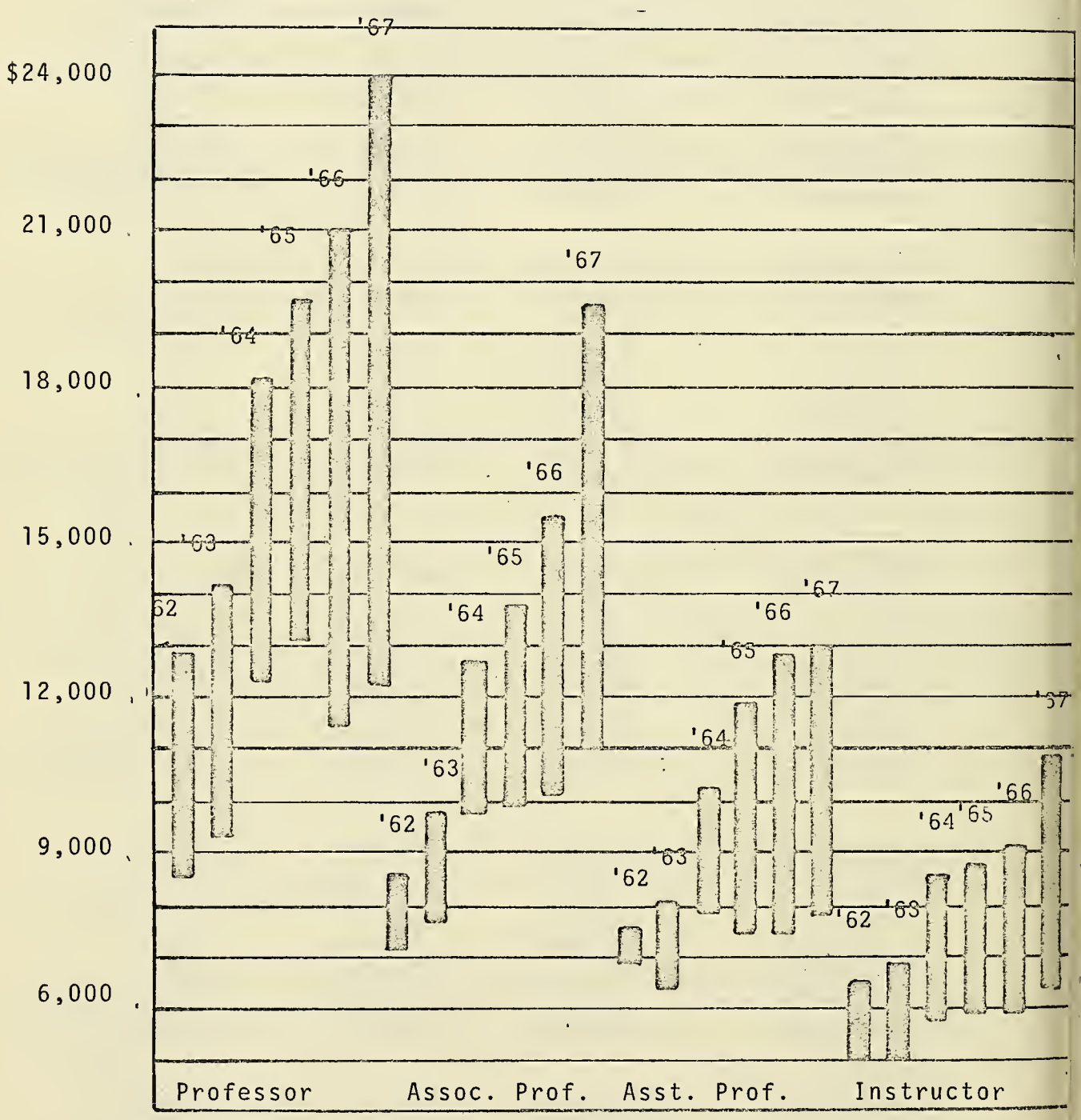
Instructors	Maximum	Median	Minimum	
1961-62	6,484	6,006	5,070	
1962-63	6,981	6,006	5,070	
1963-64	8,567	7,165	5,820	
1964-65	8,795	7,165	5,964	
1965-66	9,053	7,165	5,964	
1966-67	10,000	8,000	6,400	(6,500)

Lecturer	Maximum	Median	Minimum	
1966-67	10,900	9,300	6,500	(6,500)

Figures in parentheses represent minimum salaries if the bottom 2% are eliminated. This exclusion is customary in analyses by the A.A.U.P.

FACULTY SALARY RANGES (1966-1967)

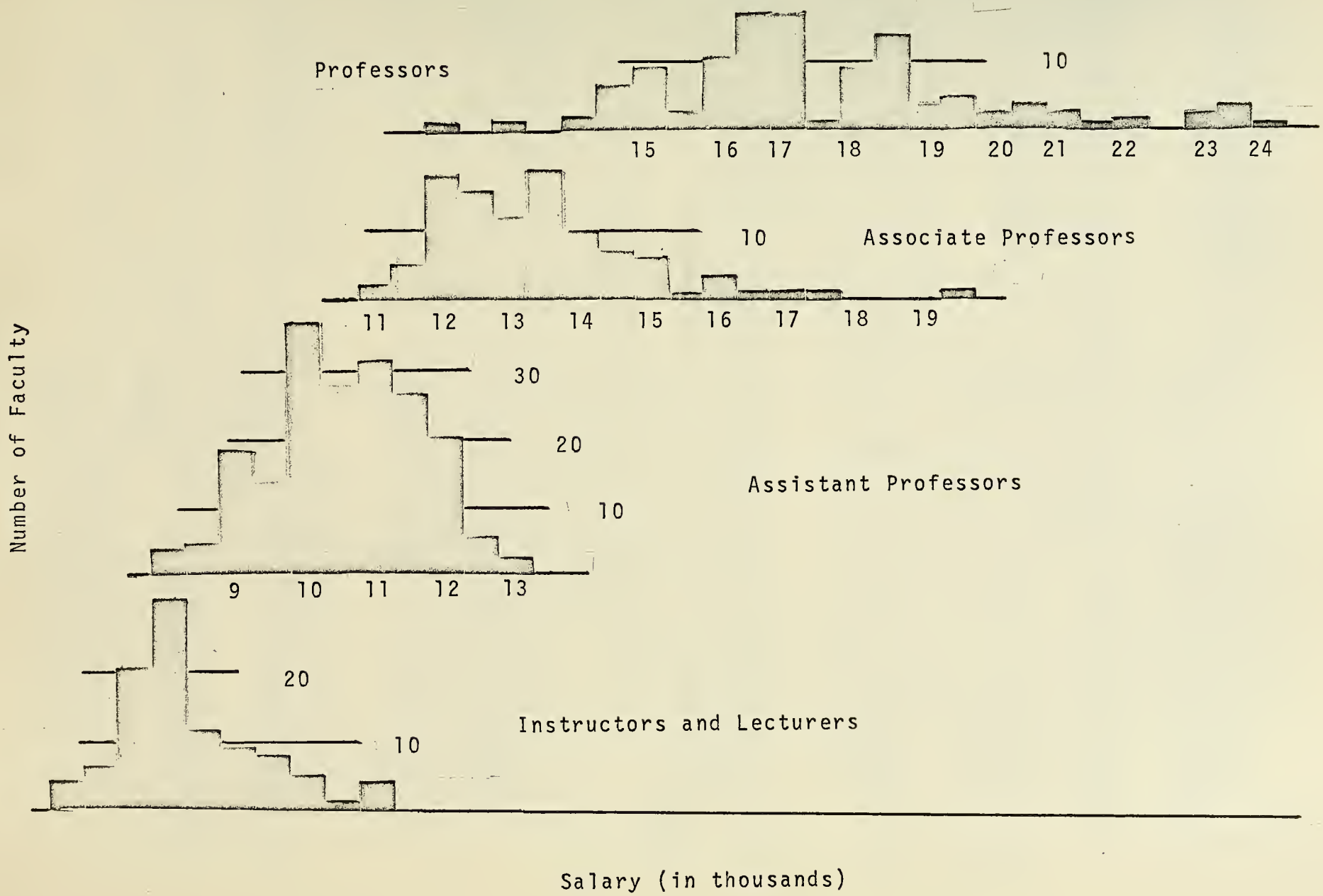
COLLEGE OF ARTS AND SCIENCES



Salaries are those actually paid in March of the indicated years.

COLLEGE OF ARTS AND SCIENCES

SALARY DISTRIBUTIONS - MARCH 1967



In the process of making 9 new faculty appointments (2 professors, 2 associate professors, and 5 assistant professors) the Department of Economics examined a total of 423 vitae and brought 32 prospective candidates to this campus for interviews.

The number of new, full-time faculty according to rank and type of position (new or old) is presented in Table 15. The distribution according to division, department and rank is presented in Table 16. The overall break-down by rank is very close to that of last year. For example, of the 127 newly-sppointed full-time faculty, 35 (28%) were at the associate or full professor rank. The corresponding percentage for last year was the same.

Appendix B contains brief biographies of all newly-appointed full-time faculty arranged according to division, department, and rank. It is a pleasure to acknowledge the key role played by department heads and by other members of the faculty who helped with this year's unusually successful recruitment.

The total number of faculty positions in this College for 1967-68 will be 606. As of June 15, 1967 only 6 of these positions were unoccupied; it is almost certain that all will be filled in response to last-minute needs.

3. FELLOWSHIPS AND OTHER SPECIAL RECOGNITION ACCORDED MEMBERS OF THE FACULTY

Three Fulbright awards, four Guggenheim Fellowships, two Sloan Foundation Fellowships, and one Fellowship and one summer stipend award of the National Endowment for the Humanities are included among the several grants for study and research made to members of our faculty.

Below is a list of those faculty who were awarded fellowships.

Fine and Performing Arts

Bezanson, Philip T. - Professor and Head, Music; Guggenheim Fellowship for Music Composition, June 1 September 1, 1967 and June 1 - December 31, 1968

Stern, Robert L. - Instructor, Music; Resident Fellowship, MacDowell Colony, June 15 - July 15, 1967

Humanities

Doherty, Robert W. - Assistant Professor, History; National Endowment for the Humanities Fellowship for study in 1967-68

Hart, Robert A. - Assistant Professor, History; National Endowment for the Humanities, Summer stipend, 1967

McCarthy, Harold T. - Associate Professor, English; Fulbright award to lecture and consult on American Literature at University of Rome, Center on American Studies, 1967-68

Reuben, Ruth - Instructor, Romance Languages; Fulbright award to study French Medieval Literature at University of Toulouse, France

Social Sciences

Feit, Ewald - Assistant Professor, Government; Mershon Center Fellowship, Ohio State, 1967-68

Mayhew, David R. - Assistant Professor, Government; American Political Science Association Congressional Fellowship, 1967-68

Oppenheim, Felix E. - Professor, Government; Fulbright award, Italy, spring 1967

Seligman, Ben B. - Director, Labor Relations and Research Center and Professor of Economics; Guggenheim Fellowship for 1967-68

Vali, Ferenc A. - Professor, Government; American Research Foundation Fellowship for study in Turkey, 1967-68

Biological Sciences

Harvey, William - Professor, Zoology; Guggenheim Fellowship for study at Cambridge University in 1967-68

Pfau, C. J. - Assistant Professor, Microbiology; National Institute of Health Career Development award

Rauch, Harold - Professor, Zoology; Special Fellowship, City of Hope Medical Center, Duarte, California for study in 1966-67

Roberts, John L. - Associate Professor, Zoology; Special Fellowship, National Institute of Health for study at the University of Bristol in 1966-67

Schuster, R. M. - Professor, Botany; Guggenheim Fellowship to New Zealand, February - August 1967

Physical Sciences

Brandts, John F. - Associate Professor, Chemistry; Alfred P. Sloan Research Fellowship for 1967-69

Byron, F. W. - Assistant Professor, Physics; Sloan Foundation Fellow for 1966-67 for study at the University of Brussels

George, John W. - Associate Professor, Chemistry; Fellowship for study in Norway in 1967-68, Royal Norwegian Council for Scientific and Industrial Development

4. FACULTY GROWTH GRANTS

We are pleased to report that 13 faculty in our College were awarded Faculty Growth Grants by the University to support their research, scholarly, or creative work during the summer of 1967:

Name	Rank	Department
Aczel, T.	Visiting Lecturer	English
Bennett, D. C.	Associate Professor	Philosophy
Boudreau, H. W.	Assistant Professor	Romance Langs.
Doherty, R. W.	Assistant Professor	History
de la Fontaine, G.	Assistant Professor	Romance Langs.
Humphrey, R. S.	Instructor	Romance Langs.
McKibben, J. J.	Assistant Professor	Mathematics
Perry, V. G.	Lecturer	English
Pope, Robert G.	Instructor	History
Proulx, D. A.	Assistant Professor	Sociology-Anthropology
Roy, J. A.	Assistant Professor	Art
Shepard, J. S.	Instructor	Zoology
Wang, H-M.	Assistant Professor	Art

F. REPORT OF THE ASSOCIATE AND ASSISTANT DEANS

The judiciary responsibilities of Deans Horrigan, McFarland, Rollason, Savereid and Wagner connected with student appeals for exceptions to University and College regulations, again consumed an inordinately large number of hours. In an effort to expedite this procedure, productive meetings with groups from the Health Services and from the Dean of Students' staffs were held. These meetings led at least to clarification of, if not complete agreement on, the points commonly at issue. A luncheon with Dean Tunis and the accompanying discussion of admissions led to efforts by the group to recruit more of the better-qualified applicants.

The results of former Assistant Dean Harry Schumer's investigation of changes of major stimulated this group to urge the establishment of CASIAC, The College of Arts and Sciences Information and Advising Center which is discussed elsewhere.

The group also organized a second Freshman Week Lecture series Deans Savereid and McFarland were instrumental in organizing a Summer Reading Program with follow-up discussions in the fall. Five books, available in paperback editions, were selected:

Duberman, In White America
Eisley, The Immense Journey
Neill, Summerhill
Koestler, Darkness at Noon
Armitage, Copernicus, the Founder of Modern Astronomy

Meetings with groups of students were also continued. One such meeting was held to collect student reaction to the CASIAC plans. At a meeting in the spring, various academic matters were discussed after Dean Hunsberger presented copies of Palgrave's The Golden Treasury to Michael McGrath, David Palmer, and Brenda Finn for outstanding performance in the English 128 course. Dean McFarland arranged several meetings with groups of freshmen throughout the year and Dean Horrigan had a series of luncheons during April with groups composed mostly of seniors to recognize their superior academic achievements and, incidentally, to glean some reactions to their educational experience.

The transfer students 1) liked the broad selection of courses here, 2) admired the caliber of their professors here, and 3) appreciated the large amount of personal attention they had received. The underclassmen wished that more such opportunities for association with superior upperclassmen were readily available. Things that these students deplored were 1) the scarcity of quiet places to study, 2) difficulties in getting books from the library-professors hold them, 3) teaching by graduate assistants (but they make the best discussion leaders) 4) the scarcity of publicity on academic matters, 5) the quality of the Collegian, WMUA, and student government, and 6) difficulty in obtaining information on special opportunities for study and on graduate school programs and admission. Some of these can be easily alleviated.

1. FRESHMAN WEEK LECTURE SERIES

At one of the Dean's conferences with students, the lack of intellectual activity during the first days the freshmen are on campus in September was noted. The Freshman Week Lecture Series was instituted as a first step in remedying this situation. Eight Faculty members were invited to present a lecture on various subjects:

September 12, 1966

Our Involvement in Viet-Nam
Professor Luther Allen

A Writer's View of Creative Writing
Professor Andrew Fetler

A Sociologist Looks at Japan
Professor T. O. Wilkinson

The World of Fundamental Particles
Professor Steven Yamamoto

September 13, 1966

What Will Become of You?
Professor Milton Mayer

The American Student in the Soviet Union
Professor Thomas Dilkes

The Berlin Wall and International Politics
Professor Ferenc Vali

Microscopy Yesterday and Today
Professor Everett Anderson

The diversity of topics made it possible for students with a variety of interests to be served. As expected, Professor Allen's discussion of Viet-Nam drew the largest crowd, but all were well attended.

Plans are being made to continue this effort in September of 1967.

2. CHANGES OF MAJOR

Professor Harvey Schumer, who was Assistant Dean for the Class of 1966, studied changes of major involving the College of Arts and Sciences during the year 1964-65. His data are presented in Tables A and B on the pages which follow. In Table A the data are summarized for freshmen, sophomores, juniors and seniors in three large groups of departments in the College and in all other schools in the University. Table B presents the same data without regard for the graduating class to which the student belonged but with a finer distinction between groups of departments.

Perhaps the most surprising feature of Table A is the fact that 25 seniors changed major; how many of them postponed graduation by this change is not known. The data also shows that nearly 20% of the juniors and over 40% of both the sophomores and freshmen changed their majors. In the latter two classes nearly one quarter of the changes are within the departmental group, that is, from one discipline in the humanities, social sciences or math-sciences to another. Approximately one third of the changes in the three lower classes involved a move from the College to a major in one of the other schools in the University. Of the 434 students who made a change of this kind, 132 had been majors in the humanities, 102 in the social sciences and 200 in science-mathematics.

The number of majors who changed form another part of the Unviersity into the College is about half that of the number who left. Of the 212 who moved from another school, 76 elected a major in the humanities, 79 a major in the social sciences and 57 a major in science-mathematics.

The most striking feature of Table B is the number of changes from mathematics to some other discipline. Of the 201 such changes, which represent 36% of the majors as of September, only 9% moved to a biological or physical science whereas 25% selected a social science major and 45% selected a major outside the College. Indeed, about 36% of the majors as of September in each of the sciences and in the pre-professional curricula change major. Changes into these majors reduce the net loss to 12% in the biological sciences and 26 - 29% in the other areas. The foreign languages also have a net loss of majors, two thirds of the 103 changes (31% of the September total of majors) being into English, social sciences and education in approximately equal numbers.

The greatest absolute numbers in Table B have reference to the social sciences. This is in part a consequence of the construction of the Table; both the humanities and the sciences

are subdivided whereas the social sciences are not. Of the 1,164 students in the social sciences as of September, 52 made changes within the social sciences, 96 changed to other disciplines in the College and 104 changed to other schools, making a total of 252 (22%) changes. On the other hand, 266 students, equivalent to 31% of the number of social science majors in September, registered for a new major in one of these disciplines. One hundred-four of these new social science majors came from outside the College, primarily from the Schools of Business Administration and Education.

The greatest percentage gain in majors is in Art and Music. Only 9 of the 112 students majoring in these fields changed to a new major, whereas 39 students elected these disciplines.

The scarcity of changes from the humanities to a major in one of the sciences or mathematics is striking. Changes in the other direction, however, are numerous.

Changes between other schools in the University were not studied except in cases involving changes into and out of the College of Arts and Sciences. It may be noted, however, that 65 majors in the School of Engineering changed to a major in the College, 69% of them nearly equally divided between mathematics and the social sciences, whereas only 22 students changed from the College into Engineering. Transfers from the College into each of the other schools, however, exceeded the moves in the opposite direction.

TABLE A: CHANGES OF MAJOR 1964 - 1965

		Change Into						
		H	SS	SM	U	T	E	T/E as % of E
Seniors								
Change From:	H		1		1	2	304	.7
	SS				2	2	279	.7
	SM	3	5	4	1	13	215	6.1
	U	1	7			8		
	T	4	13	4	4	25	798	3.1
Juniors								
Change From:	H	9	22	1	7	39	421	9.3
	SS	12	16	2	16	46	274	16.8
	SM	11	13	12	15	51	263	19.4
	U	15	12	8		35		
	T	47	62	23	38	171	958	17.9
Sophomores								
Change From:	H	53	45	7	47	152	522	29.1
	SS	31	15	4	31	81	286	28.3
	SM	31	45	32	66	174	382	45.6
	U	35	27	16		78		
	T	150	132	59	144	485	1190	40.6
Freshmen								
Change From:	H	41	28	3	78	150	570	26.3
	SS	41	21	6	55	123	325	37.8
	SM	76	75	52	119	322	705	45.7
	U	25	33	33		91		
	T	183	157	94	252	686	1600	43.0

Code:
- H: Fine Arts and Humanities
- SS: Social Sciences
- SM: Sciences and Mathematics
- U: Other Schools of the University
- E: Number of students in September 1964
- T: Totals

TABLE B: CHANGES OF MAJOR 1964 - 1965

From	Change Into														
	A.M.	E.	F.L.	O.H.	S.S.	B.S.	P.S.	M.	Pre.	Bus.	Ed.	Eng.	Med.T.	Other	Total
A.M.	0	2	1	1	2	0	0	0	0	0	3	0	0	0	9
E.	8	0	7	19	35	1	1	0	2	10	22	1	3	5	114
F.L.	3	20	7	11	25	1	0	1	0	5	22	0	1	7	103
O.H.	1	14	3	5	34	0	0	2	1	16	19	0	1	13	109
S.S.	11	34	9	30	52	3	2	5	2	39	38	1	1	25	252
B.S.	3	8	5	6	15	10	3	1	6	7	10	1	9	19	103
P.S.	1	10	9	5	27	6	6	13	4	6	3	7	4	6	107
M.	3	18	5	11	50	13	5	0	6	39	25	6	4	16	201
Pre.	4	18	3	12	47	19	5	2	0	13	1	6	9	11	150
Bus	0	8	0	6	24	1	0	2	2						43
Ed.	2	12	3	11	15	2	0	2	0						47
Eng.	1	4	0	8	18	2	6	19	7						65
Med.T.	0	3	0	2	5	3	0	1	0						14
Other	2	6	2	6	17	6	1	2	1						43
Total	39	157	54	133	366	67	29	50	31	135	143	22	32	102	1360
No. Stud. 9-64	112	752	323	631	1164	294	299	557	415	678	607	898	104	953	7687
Net Gain	30	43	-49	24	114	-36	-78	-151	-119	92	96	-43	18	59	

Code:

A.M. = Art and Music
E. = English
F.L. = Foreign Languages
O.H. = History, Philosophy, Speech
S.S. = Four Social Sciences
B.S. = Biological Sciences
P.S. = Physical Sciences
M. = Math
Pre. = Pre-Dental, Med., Vet.
Bus. = Business Adm.
Ed. = Education
Eng. = Engineering
Med.T. = Medical Technology
Other = Other Schools

3. C A S I A C

COLLEGE OF ARTS AND SCIENCES INFORMATION AND ADVISING CENTER

The large number of changes of major during the first two years, 40% for both lower classes according to a recent survey, coupled with imbalances in the distribution of the advising chores, led first to a period of study and finally to the formulation of a proposal to change the system of advising underclassmen within the College. This proposal was accepted by the faculty at a meeting on October 5, 1966.

Under the new system, students of the class of 1971 will not have to choose a major until their fourth semester. They may make this choice earlier, but it is not mandatory. Once a student has chosen a major, he will be assigned a departmental advisor as at present. Until this time, however, the student will be able to get academic counseling at a special center called College of Arts and Sciences Information and Advising Center. As the name implies, the informational service is expected to be one of the major contributions of the Center. This aspect of the Center's activity will be available even to students who have selected a major and will aid in such matters as adding and dropping courses.

The permanent staff of CASIAC will be minimal and there are enough faculty volunteers to serve in the Center to meet the anticipated needs. The Assistant and Associate Deans will direct the operation of the Center, which will initially be housed in South College.

G. CURRICULUM

1. REPORT OF CURRICULUM COMMITTEE

The appointed members of this year's Committee were Professors Allen, Emerson, Greenfield, Ilardi, Maki, McWhorter, Stein, and Wilkinson and the Assistant Deans continued as ex officio members.

The Committee devoted many hours to the consideration of the new programs leading to the Bachelor of Fine Arts and the Bachelor of Music degrees which were approved. For the first time, the referendum clause concerning Committee actions, was invoked when Professor T. O. Wilkinson requested that the question of incorporating these specialized programs into the College be referred to the Faculty. The Faculty endorsed the Committee's action with only a few scattered, dissenting votes.

The other major curricular changes were the initiation of a new major program in Biochemistry and a reorganization of the major program in German, which included the offering of work in Danish for a supporting language and Swedish for the future.

The number of new courses, aside from the new degree programs already mentioned, was relatively small. One noteworthy addition is an introductory course in Geology which departs from the traditional pattern--a semester of physical geology followed by a semester of historical geology--by integrating both aspects throughout the year. Table 20 gives the numerical summary. The College for this year had 188 elementary, 521 advanced, and 57 seminars or special problems courses. During the year 19 new elementary courses (and 2 dropped), 35 new advanced courses (and 5 dropped), and 1 new special topics course were approved for next year. Thus we find a net of 48 courses added to the College total of 766; an increase of about 6.3%.

The table also shows, in the third column, the number of formal courses taught during the year in the form of a fraction. The College total shows that 617 of the 766 courses were taught during the year which is slightly over 80%.

2. CURRICULUM STUDY COMMITTEE

A Curriculum Study Committee was appointed in the spring of 1966 to undertake a thorough study of the College curriculum and to recommend any changes considered desirable. This committee, under the chairmanship of Professor Le Roy F. Cook, met for several days of concentrated study at the University property on Nantucket last September. During the academic year the committee continued their deliberations in regularly scheduled meetings one morning each week and concluded the year with another week of discussion at Woolman Hill in Deerfield.

At a meeting of the faculty this spring the committee requested and was granted an extension until October 15, 1967 for the submission of its final report.

H. GRADUATE TEACHING ASSISTANTS

1. UTILIZATION OF GTA'S IN UNDERGRADUATE COURSES

Table 19 presents a detailed summary, by department and division, of all courses in which TA's had contact with undergraduates in the fall semester of 1966-67. Separate tabulations are recorded for "regular" sections, quiz sections, and lab (or studio) sections.

Throughout the College, TA's were used in 682 sections of 71 courses. (In these same 71 courses, regular faculty members taught 399 sections.) Of the 682 sections taught by TA's, 97 were "regular" sections, 101 were quiz sections, and 484 were lab (or studio) sections.

By far the largest use of TA's in "regular" sections occurred in English composition (51 sections), elementary and intermediate foreign languages (45 sections), and in the elementary and intermediate mathematics courses (33 sections). Only 1 "regular" section of a "200" course was taught by a TA.

Of the 101 quiz sections taught by TA's, 31 were in History and Philosophy, 60 in the Social Sciences, and 10 in the Physical Sciences.

Of the 484 lab (or studio) sections taught by TA's, most were in the Physical Sciences (296) and Biological Sciences (99), the remaining being scattered among Psychology and foreign language laboratories, Economics help sections, and Art studio sections.

2. SOME STATISTICS CONCERNING INSTRUCTION PROVIDED BY GRADUATE TEACHING ASSISTANTS - A STUDY BY ASSISTANT DEAN ROLLASON AND ASSOCIATE DEAN WAGNER

Faculty concern over the use of graduate teaching assistants (GTA's) in elementary courses is common on this and other university campuses. The study which is reported here presents some objective evidence based upon students' grades which is relevant to an evaluation of the effectiveness of the instruction provided by these "junior instructors". Grades earned by students during the academic year 1965-66 in several pairs of courses which students frequently take in sequence were analyzed to determine whether the performance in the second course seemed to reflect differences in instruction in the preceeding course. The results, which are based on nearly 6,000 pairs of enrollments involving over 2,500 students, reveal no differences in performance, as measured by the grade in the follow-up course, which can be traced from the dichotomous division of the previous course into sections with or without GTA participation in the teaching.

The first step was to select pairs of sequential courses which involved reasonably large numbers of students and which had varying degrees of GTA involvement during the fall semester. Courses which had at least some meetings in multiple sections, some of which were taught by members of the faculty whereas others were taught by GTA's were identified. This latter requirement restricted the study to freshman and sophomore courses in some of the humanities, social sciences and mathematics. Although large numbers of GTA's teach in the laboratory science courses, these courses could not be included in the study because instructio is similar in all sections. Upper level courses were eliminated because, at the University of Massachusetts, GTA's function only as assistants with no independent teaching duties in such courses.

Once the particular courses were chosen, it was possible with the help of the Registrar's Office and the Data Processing Center, to obtain records for all students who were enrolled in both semesters of the courses to be studied. The crucial data for each student were (a) the pair of courses in question, (b) the student's section during the fall semester, whether or not it was one in which a GTA had some involvement, and (c) the student's grade in the spring semester. The various pairs of courses were kept separate and are so reported in Tables 20 and 21. Within each pair of courses the records were divided into two sets. One set contained the students with GTA involvement during the fall semester and the other contained the students with no GTA involvement during the fall. The spring semester grades of these two sets were compiled separately, and the resulting grade distributions were compared.

One important extension of this procedure was carried through. After the data were assembled, it was realized that a further subdivision of the English Composition (111-112) data was possible. Students who show a weakness in grammar and composition are assigned to "remedial" sections of English 111, with an extra class period each week and extra work on grammar during the first semester. These students disperse during the spring semester into various sections of the 112 course. In this case then, we also separated the 112 records of students from "remedial" sections of course 111 from the others and made the same subdivision of both the "remedial" and the "regular" into sets with or without GTA involvement. It was found that the grade distribution was independent of GTA involvement both for the "remedial" group and for the "regular" group, Table 21, B. However, the grade distributions in the spring semester course for the remedial group and for the regular group do differ markedly, Table 20; the recognition of significant differences in the distribution of grades between these two groups provides a measure of the validity of the lack of differences found in the other comparisons.

This study should not be looked upon as an experiment to determine the effectiveness of GTA's; the most that can be said for it is that it is a partial evaluation of the use of GTA's at the University of Massachusetts. There are many other factors which should come into a complete evaluation. As far as performance in the follow-up course is concerned, it appears that the GTA's are as effective (or ineffective) as regular faculty. Can one extrapolate to the extent of suggesting that if GTA's have no measureable effect on the performance in the immediately following course, they also have no measureable effect on subsequent performance?

3. STATISTICAL SUMMARY - STUDY OF GTA'S

Tables 20 and 21 display the comparisons of grade distributions in the second course of each two-course sequence investigated with the students divided into two groups according to their experience in the preceding course, i.e. all instruction provided by a member of the faculty vs. some involvement of GTA's in their instruction. Each comparison is made up of four columns of numbers under two headings. Each column of numbers not in parentheses shows a grade distribution as the number of A's, B's, C's, D's and X's reported. The symbol X means "did not successfully complete the course" and includes F's, WF's, W's, etc.. Because we are concerned with the performance in the second course, it seems appropriate to include all sorts of lack of success.

The numbers in parentheses were computed to provide the basis for the comparison of the distributions. If there were the same number of students with each kind of experience, the two numbers in parenthesis for each grade would each be half the sum of the observed number of grades. The two numbers in parentheses show how the number of grades at each level would be split between the two groups of students if the division were in the same ratio as the total number of students involved.

The close agreement of the observed grade distribution with the proportional distributions (shown in parentheses) is the basis for our claim of no difference except for the data in Table 20 which compares the English 112 grade distribution of students from "remedial" sections of English 111 with that of students from "regular" sections of the 111 course. However, there is a standard statistical procedure for evaluating such a comparison of distribution, namely, the chi-squared test for homogeneity. The value of chi-squared is given with each comparison; all of them involve four degrees of freedom and the 90th percentiles of this chi-squared distribution is 7.78. In Table 21, Sections A and B, the values of chi-squared range from .49 to 6.28 and are of the size to be most easily accounted for by other factors than the experience in the preceding course.

The mean grade on our quality point scale has also been reported for each group. Except for the data in Table 20, none of the differences between means (Table 21) is statistically significant, the largest t-value being about 1.3.

I. SENIOR MATHEMATICIAN ON LECTURE TOUR (SMOLT)

SMOLT was a special program initiated this year to bring about closer contact between leaders in the field of mathematics, the faculty and the graduate students. Distinguished scholars in the field of differential topology and transformation groups were invited in the fall; specialists primarily from the field of algebraic geometry visited in the spring. Most of the guests gave a one to three week series of lectures. In addition, Prof. Yasuo Akizuki of Tokyo University of Education joined the staff for the spring semester. The program was reported to be most stimulating and to have attracted persons from a wide area.

The guest lecturers were as follows:

Prof. Edgar H. Brown, Brandeis University

Prof. Pierre Conner, University of Virginia

Prof. Heisuke Hironaka, Columbia University

Prof. Wu-Yi Hsiang, Institute for Advanced Study

Prof. Jun-ichi Igusa, Johns Hopkins University

Prof. Hideyuki Matsumura, Columbia University

Prof. Frank A. Raymond, Institute for Advanced Study

Prof. Michio Suzuki, University of Illinois

Prof. John G. Thompson, University of Chicago

Prof. Philippe M. Tondeur, Wesleyan

Prof. C. T. Yang, University of Pennsylvania

J. OVERSEAS PROGRAMS

1. SUMMER SESSION AT BOLOGNA, ITALY, PROF. HOWARD H. QUINT, DIRECTOR

The opportunity to study at this ancient center of learning in northern Italy, which is world famous for its art treasures, was the privilege of 64 students, 50 of them regularly enrolled at the University. Two courses were taught by members of our faculty, namely History of the Renaissance, Prof. Vicent Illardi, and Renaissance Art, Prof. Paul Norton. Two other courses, the Romantic Poets and International Organization were taught by Dr. David Erdman of the New York Public Library and Prof. Ruth Lawson of Mt. Holyoke College, respectively. Weekend trips to various places in Italy were also a part of the total program.

2. OXFORD SUMMER SEMINAR, PROF. ERNEST H. HOFER, DIRECTOR

The Oxford Summer Seminar gave courses from the current Arts and Sciences catalogue under "English" at St. Hilda's College, Oxford. There were eleven courses in all, including both graduate and undergraduate, and a series of guest lectures. Dons were entirely from Oxford, all briefed in detail about American marking systems and American courses. Four had had U.S. experience. Instruction took place in rooms of the college or at the quarters of one Fellow or another; some classes included trips to special collections (Chaucer, for example) to examine manuscripts.

One hundred twenty-four students participated, five of whom were counselors and therefore did not take courses. Sixty-three percent originated from the University of Massachusetts; some of the others (representing 32 colleges and universities) were graduate students who had a connection with the University of Massachusetts on the undergraduate level. The "Four Colleges" were represented, Mt. Holyoke being the largest participant outside the University with six young ladies attending.

All members were able to go to the theatre in London and Stratford, to visit places of historic and literary merit, and to use the full resources of the Bodleian Library (special tours involving no more than eight students per time were taken on an hour-long inspection).

St. Hilda's College offered its full facilities, and all members were able to obtain room and board there. Recreational equipment was also available, including boats (punts) on the river on which the college fronts.

Prof. Hofer will direct a similar program during the summer of 1967.

3. ACADEMIC YEAR PROGRAM IN FREIBURG, GERMANY

An Atlantic Studies Institute, established in co-operation with the University of Freiburg, became a reality when Professors Marc Ratner, who served as resident director, and Frederic C. Ellert and a group of twenty graduate and fifteen undergraduate students assembled in Germany on September 10, 1966.

The program is broad and flexible, though the pre-requisite of fluency in German probably tends to restrict the number participants from fields other than Germanic Languages and Literature. Nonetheless five students with a major in English and one each in Government, History, "pre-med", and Sociology were included in the group.

Four courses was the usual academic load. Each student enrolled in both the regular courses of the University of Freiburg and in the courses taught by the members of our faculty in the Atlantic Studies Center.

A series of public lectures were arranged through the generosity of the Alumni Association, which provided both $2,000 for honoraria and an additional $2,000 for student scholarships.

The calendar for the academic year in German universities includes a mid-winter vacation of several weeks duration; most students in our program enjoyed travel in other parts of Europe during this interval. The spring or summer term extends from March through July. As a consequence of this schedule, the group in Freiburg this year has not yet returned, and a final evaluation of the first year of operation of the program cannot yet be made.

Prof. Peter Heller will serve as Resident Director of the program next year. Prof. Ferenc Vali, Department of Government, will teach at the Center during the winter term and Prof. Winfred Bernhard, Department of History, will teach during the summer term next year.

4. NDEA SUMMER INSTITUTE FOR ADVANCED STUDY FOR FRENCH TEACHERS

Prof. Stowell C. Goding has been making plans for another institute to be conducted at Arcachon, France, from June 15 to August 16, 1967. He directed a similar institute during the summer of 1965.

K. NDEA AND NSF SUMMER INSTITUTES IN AMHERST

The education of teachers is an important concern of the College. Three institutes with this particular goal were held on the campus during the summer of 1966.

1. HISTORY

An NDEA Institute for high school teachers of history was held from June 26 to August 12, 1966 under the direction of Professor Dean Albertson. The budget of $152,000 represented the largest award in the country for an institute in history. The 116 participants enjoyed and profited professionally from an interdisciplinary, "topics" approach to the content of American History. The program included not only lectures and discussions but a field trip to Plymouth and other sites of historical importance. The staff of five, in addition to the Director, consisted of two Historians, Prof. Louis Filler of Antioch College and Prof. Jules Davids of Georgetown University, two Sociologists, Prof. Orrin Klapp of San Diego State College and Prof. Matthew Epstein of Michigan State University and one Geographer, Prof. Philip Wagner of the University of California (Davis).

Prof. Albertson reported that, "Clearly, the participants benefitted handsomely by the institute, but at the same time, fundamental and exciting educational stimulation was the reward of the department for its effort."

2. BOTANY

An NSF Institute for twenty-two college teachers of Botany, Prof. E. L. Davis, Director was instituted at the request of the Botanical Society of America. It was the sixth time since 1954 that the Botanical Society had requested that a specific institution seek NSF support to conduct an advanced level summer institute in botany for teachers at small colleges. The budget of $31,000 made it possible to invite as lecturers many of the most eminent botanists in North America; three were members of the National Academy of Sciences, one of the Royal Society of England, and one of the Canadian Academy. Three past presidents (not including Dr. Tippo) of the Botanical Society took part.

The visiting lecturers were:

Edgar Anderson, Professor, Missouri Botanical Garden.
Herbert G. Baker, Professor of Botany and Director of the Botanical Garden, University of California (Berkeley).
Roderick K. Clayton, Senior Investigator in Biophysics, Cornell University.

Ralph E. Cleland, Professor of Botany, Indiana University.
Harriet Creighton, Professor, Wellesley College.
Theodore Delevoryas, Professor of Botany, Yale University.
William S. Hillman, Plant Physiologist, Brookhaven National Laboratory.
William P. Jacobs, Professor of Biology, Princeton University.
William A. Jensen, Professor of Botany and Associate Dean, University of California (Berkeley).
Gleb Krotkov, Professor of Botany, Queens University, Canada.
Irene Manton, Professor of Botany, Leeds University, England.
Keith R. Porter, Professor of Biology, Harvard University.
Franklin W. Stahl, Professor of Biology, Institute of Molecular Biology, University of Oregon.

3. ENGLISH

The NDEA Summer Institute for Advanced Study in English was held under the direction of Richard O. Ulin of the School of Education. This program was sponsored by the U.S. Office of Education and was offered in cooperation with the School of Education. Its objective was to improve the teaching of English in New England's secondary schools. Forty-five experienced teachers from public, private and parochial secondary schools--most of whom were from Massachusetts but including several from the greater New England area and beyond--registered for this accredited program, offering courses in Composition, Poetry, and Criticism. Up to six hours of graduate credit could be earned by each participant. English Department faculty who offered courses included Professors Robert Bagg, Joseph Langland, Simon Lesser, Charles K. Smith and Charles Adams. The Institute, similarly constituted, will again be offered during the summer of 1967.

L. SPECIAL AWARDS TO OUTSTANDING STUDENTS

Five undergraduates and one graduate student achieved distinction and national recognition by the award to them of graduate fellowships. These fellowships included four Fulbright awards, one Woodrow Wilson award, one National Phi Kappa Phi Fellowship and one National Science Foundation Fellowship. It should be noted that Miss Kucinski was one of only 15 recipients of Phi Kappa Phi Fellowships and that Mr. Liszt was the recipient of both Fulbright and Woodrow Wilson Fellowships.

Carmen Lisbeth Grosse, 1967, German major, Fulbright Grant for study at the University of Mainz, Germany.

Chester Jablonski, 1967, Chemistry major, Fulbright award for study at the University of Munich, Germany.

Helen Kucinski, 1967, Zoology major, National Phi Kappa Phi Fellowship. Miss Kucinski will study at Yale University.

Harvey S. Liszt, 1967, Astronomy major, Fulbright and Woodrow Wilson awards. He accepted the latter and will study at Princeton University.

Nancy Winsor, 1967, Zoology major, National Science Foundation Graduate Fellowship. Miss Winsor will study at Purdue University.

Johanna Butler, French doctoral candidate, Fulbright Grant for study of French Literature in France.

M. PROGRAMS IN THE FINE AND PERFORMING ARTS

Programs in the fine and performing arts are a significant part of the composite responsibilities of a liberal arts college. They are co-curricular in nature and should grow and mature with other parts of the College and University. The contributions of the Departments of Art, Music and Speech are summarized briefly in the following paragraphs. The performances of the latter two departments are at a high, professional level and attract large audiences.

The Department of Art, in cooperation with the Student Union Art and Music Committee sponsored a series of exhibits. One hundred forty-one works by distinguished artists were added to the University collection which now has a value of approximately $140,000. Although the collection is still relatively small, its growth in the past few years is heartening.

The performances sponsored by the Department of Music have been numerous. Nine members of the faculty performed in a series of ten Faculty Recitals. More than 40 students performed in eight (undergraduate) Student Recitals and two Graduate Student Recitals. The University Chorale and University Chorus each presented programs on campus and the former group of 51 vocalists also presented a program at the University of New Hampshire and at 10 high schools in the Commonwealth during a spring tour. Both the Symphony Orchestra (77 musicians) and the Symphony Band (74 musicians) gave two concerts; in addition the Symphony Band presented concerts at four high schools during their spring tour.

In addition to the concerts in which University musicians were the performing artists, the Department also sponsored a series of four concerts by the Beaux-Arts String Quartet. Open rehearsals preceeded each concert by this famed quartet.

Finally, the role of the Music Department in making possible an opportunity for local, talented musicians to perform appropriat orchestral literature should be noted. The University Youth Orchestra, established in the spring of 1965 and now composed of 50 young musicians presented two concerts during the past academic year.

The theater and forensics are both supported by the Department of Speech. During the regular academic year, the University Theatre, despite the disastrous Conservation Building fire which destroyed nearly $50,000 worth of equipment and material, and forced cancellation of two major productions, produced seven

theatrical events and a series of twelve films, playing to a total audience of approximately 9,300 at a total production cost of approximately $5,800. The events included two major productions (Malnar's Lilliom and the Thurber Carnival), one readers' theater production, three M.F.A. productions, and one production by an acting class. Approximately 250 students were involved in some phase of these productions, either as performers or backstage workers. In addition, a series of monthly Reading Hours was begun in January, involving oral readings by invited students. Total attendance was approximately 700.

During the summer of 1966, the Summer Theatre Repertory Company presented three major productions and one children's play to a total audience of approximately 7,800 at a total production cost of approximately $6,000.

The intercollegiate debate program, under the direction of a new faculty member, Ronald J. Matlon, was expanded considerably. A total of 28 students (double last year's figure) participated in a total of 24 intercollegiate debate tournaments. Furthermore, a series of eight on-campus public debates was initiated. The public debates, which were attended by a total of approximately 1,400 people, involved a variety of controversial campus, national and international issues.

APPENDIX A

TABLE 1: PROFESSIONAL POSITIONS (FTE) FILLED BY RANK

FALL SEMESTER

	1964	1965	1966
(a) Administration			
Dean	1	1	1
Associate Dean	1	1	1
Assistant Deans	1 1/2	2 1/2	2 1/2
Totals	3 1/2	4 1/2	4 1/2
(b) Faculty			
Professors	82 (22.2%)	93 1/2(20.7%)	117 (22.0
Assoc. Prof.	64 (17.3%)	82 (18.2%)	94 (17.7
Asst. Prof.	131 (35.5%)	175 1/4(38.9%)	213 1/2(40.2
Instructors	92 1/4(25.0%)	100 3/4(22.2%)	93 1/4(17.3
Lecturers	0	0	14 3/4(2.8
Totals	369 1/4	451 1/2[1]	532 1/2[2]
(c) Non-Teaching			
Staff Associates	0 (vacant)	1	1
Staff Assistants	1	3	7
Professional Tech.	0	0	1
Totals	1	4	9
(d) Teaching Assistants	288	341[3]	353[4]
(e) Postdoctoral Research Associates (Not on State funds)			
Chemistry	10	8	11
Physics	0	0	2
Sociology	0	1	2
Zoology	3	7	14
Totals	13	16	29

Footnotes

(1) There were 10 unfilled faculty positions, giving a total of 461 1/2 faculty positions (FTE).

(2) There were 1 5/6 unfilled faculty positions, giving a total of 533 1/3 faculty positions (FTE).

(3) This FTE figure was obtained by dividing the total allocation for TA's ($750,200.) by the budgeted average stipend ($2,200.).

(4) This FTE figure was obtained by dividing the total allocation for TA's ($847,200.) by the budgeted average stiperd ($2,400.).

TABLE 2: FACULTY POSITIONS (FTE) FILLED BY DIVISION, DEPARTMENT, AND RANK: FALL SEMESTER

Note: The number of positions of Professor, Associate Professor, Assistant Professor, Instructor and Lecturer, respectively, and the total number of positions in each department is indicated by the series of numbers in each column. Lecturers were not separately listed in 1964 and 1965; most were included with the Instructors.

	1964	1965	1966
Fine Arts			
Art	1- 3- 2 - 5 = 11	3 - 2- 4 - 5 = 14	3- 2- 6 - 6 - 1 = 18
Music	3- 1- 1 - 3 = 8	3 - 2- 3 - 2 = 10	3- 2- 7 - 2 - 0 = 1[illegible]
Speech	1- 2- 6½- 9 = 18½	2 - 1- 9 - 9 = 21	3- 2- 12 -11 - 0 = 2[illegible]
TOTALS	5- 6- 9½-17 = 37½	8 - 5- 16 - 16 = 45	9- 6- 25 -19 - 1 = 60
Humanities			
English	11-13- 18½-11 = 53½	14½-16- 19½- 14 = 64	16-16- 27 - 6 - 9 = 7[illegible]
Germanic Lang.[2]	3- 1- 6 - 9 = 19	3 - 1- 7 - 9 = 20	6- 0- 6 - 8 - 0 = 2[illegible]
History	5- 6- 11 - 7¼= 29¼	7 - 4- 15 - 9 = 35	8- 5- 19 -10 - ½= 42½
Philosophy	1- 1- 2 - 2 = 6	1 - 1- 3 - 1 = 6	2- 3- 4 - 1 - 0 = 1[illegible]
Rom. Lang.	5- 6- 8 -12 = 31	5 - 9- 8 - 14 = 36	8-12- 9 -15 - 0 = 4[illegible]
Slavic Lang.			1- 1- 1 - 1 - 2 = [illegible]
TOTALS	25-27- 45½-41¼=138¾	30½-31- 52½- 47 =161	41-37- 66 -41 -11½=19[illegible]
Social Sciences			
Economics	4- 1- 3 - 5 = 13	5 - 1- 3 - 8 = 17	5- 1- 4 - 7 - 0 = 17
Government	6- 5- 3 - 3 = 17	7 - 6- 9 - 4 = 26	8- 5- 10 - 3 - 0 = 26
Psychology	6- 1- 7½- 2 = 16½	6 - 1- 13¼- 1 = 21¼	7- 2- 14 - 0 - 0 = 2[illegible]
Soc-Anth	4- 2- 8½- 1 = 15½	5 - 2- 11 - 1 = 19	6- 2- 11 - 1 - 0 = 20
TOTALS	20- 9- 22 -11 = 62	23 -10- 36¼- 14 = 83¼	26-10- 39 -11 - 0 = 86
Biological Sciences			
Botany	4- 3- 3 - 1 = 11	3 - 5- 4¾- ½= 13¼	4- 5- 7¾- ½- 0 = 17
Microbio	1- 0- 4 - 1 = 6	1 - 0- 6 - 1 = 7	2- 0- 6 - 0 - 0 = 8
Zoology	7- 5- 7 - 0 = 19	7 - 6- 6 - 4 = 23	7- 6- 10 - 3 - 0 = 26
TOTALS	12- 8- 14 - 2 = 36	11 -11- 16¾- 5½= 43¼	13-11- 23¾- 3½- 0 = 51

TABLE 2: FACULTY POSITIONS (FTE) FILLED BY DIVISION, DEPARTMENT, AND RANK: FALL SEMESTER
(continued)

	1964	1965	1966
Physical Sciences			
Astronomy[3]	0- 0- 1 - 0 = 1	0 - 1- 1 - 0 = 2	
Biochem.[4]			1- 3- 1 - 0 - 0 = 5
Chemistry	7- 5- 14 - 5½= 31½	7 - 6- 16 - 6½= 35½	8- 6- 14 - 7 - 0 = 35
Geol.-Geog.	2- 2- 5 - 2 = 11	2 - 5- 4 - 1 = 12	2- 5- 4 - 2 - 0 = 13
Physics-Astron.	4- 3- 6 - 2 = 15	4 - 5- 12 - 1 = 22	5- 9- 16 - 1 - 0 = 31
TOTALS	13-10- 26 - 9½= 58½	13 -17- 33 - 8½= 71½	16-23- 35 -10 - 0 = 84
Mathematics and Statistics			
Math.	6- 4- 12 -11 = 33	7 - 8- 18¾- 10 = 43¾	9- 7- 22¾- 7 - 2¼= 48
Stat.	1- 0- 2 - 0 = 3	1 - 0- 2 - 0 = 3	1- 0- 2 - 1 - 0 = 4
TOTALS	7- 4- 14 -11 = 36	8 - 8- 20¾- 10 = 46¾	10- 7- 24¾- 8 - 2¼= 52
Asian Studies			1- 0- 0 - 0 - 0 = 1
Chinese	0- 0- 0 - ½= ½	0 - 0- 0 - ½= ½	0- 0- 0 - ½- 0 = ½
Japanese		0 - 0- 0 - ¼= ¼	0- 0- 0 - ¼- 0 = ¼
Comp. Lit.			1- 0- 0 - 0 - 0 = 1
COLLEGE TOTALS	82-64-131 -92¼=369¼	93½-82-175¼-100¾=451½	117-94-213½-93¼-14¾=532½

Footnotes

(1) Includes the Bureau of Government Research, which was transferred to the Department of Government in September, 1965.

(2) This department was known as German-Russian during 1964 and 1965. In 1966 two departments were formed: Germanic Languages and Literatures and Slavic Languages and Literatures.

(3) The Astronomy Department was combined with Physics in September of 1966.

(4) Biochemistry Department was separated from Chemistry in September of 1966.

TABLE 3: PROFESSIONAL PERSONNEL ACTIONS

	1964-65	1965-66	1966-67
Promotions	25	18	31
Tenure Appointments	11	7	23[1]
Resignations	18	37	45
Terminations	13		
Retirements	1	0	0
Deceased	0	0	0
Merit Increases	250	300	373
Sabbaticals	21	27	14
Leaves of Absence without Pay	19	16	15

(1) Four effective September 1, 1967 - nineteen effective September 1, 1968.

TABLE 3A: NON-PROFESSIONAL POSITIONS BY RANK: FALL SEMESTER

	1964	1965[1]	1966[1]
Secretarial			
(02) Junior Clerk, Typist	6	6	6
(03) Junior Clerk, Steno	25	31	36
(06) Senior Clerk, Typist	7	10	10
(07) Senior Clerk, Steno	12	18	21
(09) Principal Clerk	1	4	6
Totals	51	69	79
Non-Secretarial (Technical)			
(02) Laboratory Helper	1	1	1
(04) Laboratory Assistant	8	8	9
(05) Animal Room Attendant	0	1	1
(06) Mechanical Handyman	0	1	1
(07) Herbarium Curator	1	1	1
(08) Laboratory Technician	1	1	1
(08) Technical Assistant	8	12	16
(09) Carpenter	0	1	1
(09) Machinist	2	2	2
(10) Electronics Technician	2	2	3
(10) Storekeeper	2	2	3
(11) Machinist Foreman	1	1	1
(12) Principal Storekeeper	0	1	1
(12) Technical Specialist	0	0	1
Totals	26	34	42

Footnote

(1) Includes the Bureau of Government Research, which was transferred to the Department of Government in September, 1965.

TABLE 3B: FACULTY POSITIONS (FP) AND SECRETARIAL POSITIONS (SP): FALL 1966 (FTE BASIS)

Division	Department	FP	SP	FP/SP Ratio	Highest Ranking Positio
Fine and Performing Arts	Art	18	2	9.0	SCS
	Music	14	2	7.0	SCS
	Speech	28	4	7.0	SCS
Division Totals		60	8	7.5	
Humanities	English	74	9	8.2	PC
	Germanic Languages	20	2	10.0	SCT
	History	42 5/6	5	8.5	SCS
	Philosophy	10	1 1/2	6.6	SCT
	Romance Languages	44	5	8.8	PC
	Slavic Languages	6	1	6.0	JCS
Division Totals		196 5/6	23 1/2	8.4	
Social Sciences	Economics	17	2	8.5	SCS
	Government	26	5	5.2	SCS
	Psychology	23	4	5.7	SCS
	Sociology-Anthropology	20	3	6.6	SCS
Division Totals		86	14	6.1	
Biological Sciences	Botany	17 1/4	3	5.7	SCS
	Microbiology	8	1 1/2	5.3	SCS
	Zoology	26	5	5.2	PC
Division Totals		51 1/4	9 1/2	5.4	
Physical Sciences	Biochemistry	5	1	5.0	JCS
	Chemistry	35	6	5.8	PC
	Geol - Geography	13	2	6.5	SCS
	Physics-Astronomy	31	4	7.7	SCS
Division Totals		84	13	6.4	
Mathematics and Statistics	Mathematics	48	4	12.0	PC
	Statistics	4	1	4.0	JCS
Division Totals		52	5	10.4	
Chinese & Japanese		1 1/4	-	-	-
Asian Studies		1	1	-	JCS
Comparative Literature		1	-	-	-
TOTALS		533 1/3	74	7.2	
Dean's Office		4 1/2	5	-	PC
GRAND TOTALS		537 5/6	79	6.8	

Footnote

(1) Abbreviations: JCS = Junior Clerk Steno (03); SCT = Senior Clerk Typist (06); SCS = Senior Clerk Steno (07); PC = Principal Clerk(0

TABLE 3C: RATIOS OF FACULTY POSITIONS (FP) TO SECRETARIAL POSITIONS (SP) AND TO TECHNICAL POSITIONS (TP): FALL SEMESTER (1964-66)[1]

	1964	1965	1966
FP	369 1/4	461 1/2	533 1/3
SP	47	63 1/2	74
FP/SP Ratio	7.9	7.3	7.2
FP	369 1/4	461 1/2	533 1/3
TP	26	34	42
FP/TP Ratio	14.2	13.6	12.7

Footnote

(1) Computations based on total faculty positions (FTE basis) and do not include personnel in the Dean's Office.

TABLE 4: COMPARATIVE ENROLLMENTS AT U. MASS. BY CLASSES AND BY COLLEGES (1956-1966)

SEPTEMBER

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
UNIVERSITY TOTAL	4516	4791	5271	6131	6495	7018	7676	8811	10497	11859	13679
Freshmen	1148	1266	1366	1838	1725	1918	1922	2286	2592	2622	2954
Sophomore	924	1016	1126	1149	1518	1463	1651	1727	2135	2516	2904
Junior	823	879	914	994	1018	1323	1350	1648	1781	2225	2602
Senior	898	830	861	874	996	980	1217	1221	1469	1572	1971
4-YR. UNDERGRAD. TOTAL	3793	3991	4267	4855	5257	5684	6140	6882	7977	8935	10431
GRADUATE	353	430	568	780	768	845	975	1303	1846	2240	2514
Stockbridge	333	331	348	395	396	394	451	454	484	516	544
Special and/or Non-Classified	37	39	88	101	74	96	110	172	190	168	190
4-YR. UNDERGRAD. TOTAL	3793	3991	4267	4855	5257	5684	6140	6882	7977	8935	10431
ARTS & SCIENCES	1815	1759	2043	2472	2814	3116	3439	3976	4647	5060	5776
Public Health								62	104	109	122
Education		231	274	331	377	426	448	485	607	695	840
Engineering	904	967	878	849	843	836	834	847	898	894	939
Business Adm.	498	501	507	550	488	502	544	602	678	831	1043
Agriculture	297	268	277	274	313	341	361	345	395	487	620
Home Economics	150	132	122	130	115	114	137	178	194	268	369
Physical Education	78	77	98	153	135	245	263	242	278	367	467
Nursing	51	56	63	96	112	102	114	145	176	203	255
No major	----------	----------	----------	----------	----------	----------	----------	----------	----------	21	-------

TABLE 5: COMPARATIVE ENROLLMENTS IN PERCENTAGES AT U. MASS. BY CLASSES AND BY COLLEGES (1956-66)

	SEPTEMBER										
	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
UNIVERSITY TOTAL	4516	4791	5271	6131	6495	7018	7676	8811	10497	11859	13679
Freshmen	25.4	26.5	25.9	30.0	26.6	27.3	25.0	25.9	24.7	22.2	21.6
Sophomore	20.5	21.1	2.14	18.7	23.4	20.8	21.5	19.6	20.3	21.2	21.2
Junior	18.2	18.4	17.3	16.2	15.7	18.9	17.6	18.7	17.0	18.7	19.0
Senior	19.9	17.4	16.4	14.3	15.3	14.0	15.9	13.9	14.0	13.3	14.4
4-YR. UNDERGRAD. TOTAL	84.0	83.4	81.0	79.2	81.0	81.0	80.0	78.1	76.0	75.4	76.2
GRADUATE	7.8	9.0	10.8	12.7	11.8	12.0	12.7	14.8	17.6	18.9	18.4
Stockbridge	7.4	6.8	6.6	6.5	6.1	5.6	5.9	5.15	4.6	4.3	4.0
Special and/or Non-Classified	.8	.8	1.6	1.6	1.1	1.4	1.4	1.95	1.8	1.4	1.4
4-YR. UNDERGRAD. TOTAL	3793	3991	4267	4855	5257	5684	6140	6882	7977	8935	10431
ARTS & SCIENCES	47.8	44.1	47.8	50.9	53.5	54.8	56.0	57.8	58.2	56.6	55.3
Public Health								.9	1.3	1.2	1.2
Education		5.8	6.4	6.8	7.2	7.5	7.3	7.1	7.6	7.8	8.0
Engineering	23.8	24.2	20.6	17.5	16.1	14.7	13.6	12.3	11.3	10.0	9.0
Business Adm.	13.2	12.6	11.9	11.3	9.3	8.9	8.9	8.7	8.5	9.3	10.1
Agriculture	7.8	6.7	6.5	5.6	6.0	6.0	5.9	5.0	5.0	5.5	5.9
Home Economics	4.0	3.3	2.9	2.7	2.2	2.0	2.2	2.6	2.4	3.0	3.5
Physical Education	2.1	1.9	2.3	3.2	3.7	4.3	4.3	3.5	3.5	4.1	4.5
Nursing	1.3	1.4	1.6	2.0	2.1	1.8	1.9	2.1	2.2	2.3	2.5
No major										.2	

TABLE 6: TEACHING LOAD SUMMARY
FALL SEMESTER 1966

NOTE: SCrH means Student Credit Hours; SCoH means Student Contact Hours; #Secs means total number of sections: laboratory, recitation and lecture; #Crs means number of courses taught exclusive of Honors, Special Problems and Theses, all of which carry academic credit.

SP,H is the number of students enrolled in Senior Honors, Special Problems or other individual instruction. M.A. and Ph.D. is the number of active thesis projects.

The ratio of student credit hours for the spring semester to that of the fall is an index of the change in teaching load between the two semesters.

	SCrH	SCoH	#Secs	#Crs	SP,H	M.A.	Ph.D.	Second Semester
Fine and Performing Arts								
Art	3623	5814	52	23	13	10	0	1.08
Music	2024	4165	25	24	102	0	0	1.13
Speech	5687	7098	117	28	20	7	0	1.02
Totals	11334	17077	194	75	135	17	0	1.06
Humanities								
English-Journ.	21887	21887	321	59	20	24	31	1.01
Germanic Lang.	4207	4978	101	20	14	0	8	.82
History	12378	12378	210	37	25	2	3	1.01
Philosophy	1831	1857	32	11	14	1	2	1.30
Romance Lang.	8888	10482	197	49	1	0	4	.89
Slavic Lang.	758	836	21	11	5	0	0	.63
Totals	49958	52427	882	187	79	27	48	.96
Social Sciences								
Economics	4740	4740	55	21	7	1	10	.85
Government	6534	6534	96	29	10	40	20	.92
Psychology	10997	11847	63	31	29	17	35	.95
Sociology	7491	7356	37	24	9	12	7	1.08
Anthropology	1386	1386	10	9	0	2	0	1.25
Totals	31148	31863	261	114	55	72	72	.97
Biological Sciences								
Botany	3458	5390	47	12	13	5	4	.73
Microbiology	1289	2161	15	9	20	5	8	.80
Zoology	7821	13185	139	20	23	1	12	1.00
Totals	12568	20736	201	41	56	11	24	.88

TABLE 6: TEACHING LOAD SUMMARY
FALL SEMESTER 1966
(continued)

	SCrH	SCoH	#Secs	#Crs	SP,H	M.A.	Ph.D.	Second Semeste
Physical Sciences								
Biochemistry	614	908	10	4	0	2	9	.80
Chemistry	8529	13646	140	30	14	16	81	.80
Geology	2609	4304	57	15	2	12	3	.73
Geography	528	670	8	2	0	0	0	1.20
Physics	3716	4787	103	20	10	0	2	.96
Astronomy	965	984	5	5	0	0	0	1.02
Totals	16961	25299	323	76	26	30	95	.85
Mathematics and Statistics								
Mathematics	14947	15037	195	56	3	0	11	.83
Statistics	1686	1686	7	6	0	0	0	.94
Totals	16633	16723	202	62	3	0	11	.84
Asian Studies	90	116	4	4	0	0	0	1.30
COLLEGE TOTAL	138692	164241	2067	559	351	157	250	.94

TABLE 7: STUDENT MAJORS (HEAD COUNT) BY DEPARTMENT AND DIVISION

	Undergraduate			Graduate			Totals		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
Fine and Performing Arts									
Art	107	113	149	28	47	53	135	160	202
Music	17	34	37	0	0	14	17	34	51
Speech	85	105	119	25	24	20	110	129	139
Totals	209	252	305	53	71	87	262	323	392
Humanities									
English	779	921	1101	119	148	218	898	1069	1319
Germanic Lang.	72	68	61	25	46	53	97	114	114
Slavic Lang.		31	41		0	0		31	41
History	465	579	648	66	85	95	531	664	743
Philosophy	27	43	44	15	29	36	42	72	80
Romance Lang.	207	274	337	29	47	61	236	321	398
Totals	1550	1916	2232	254	355	463	1804	2271	2695
Social Sciences									
Economics	113	128	168	44	51	51	157	179	219
Government	514	584	571	74	65	78	588	651	649
Psychology	303	384	451	97	118	116	400	502	567
Sociology-Anthr.	197	239	339	41	53	69	238	292	408
Totals	1127	1335	1529	256	287	314	1383	1622	1843
Biological Sciences									
Pre-professional	317	243	132	0	0	0	317	243	132
Botany	27	33	36	23	27	26	50	60	62
Microbiology	29	42	76	16	25	34	45	67	110
Zoology	193	349	508	65	61	62	258	410	570
Totals	566	667	752	104	113	122	670	780	874
Physical Sciences									
Chemistry	138	212	225	154	149	136	292	361	361
Geology	34	41	71	22	35	26	56	76	97
Physics	58	72	78	26	58	72	84	130	150
Astronomy	9	16	27	0	0	0	9	16	27
Totals	239	341	401	202	242	234	441	583	635
Mathematics & Statistics									
Mathematics	438	549	557	35	63	91	473	612	648
Statistics	0	0	0	5	17	7	5	17	7
Totals	438	549	557	40	80	98	478	629	655
COLLEGE TOTALS	4129	5060	5776	909	1148	1318	5038	5208	7094

TABLE 8: FTE STUDENTS (S) BY DEPARTMENT AND DIVISION (FALL SEMESTER)

	F. T. E. STUDENTS (S)		
	1964	1965	1966
Fine and Performing Arts			
Art	171	184	260
Music	69	117	142
Speech	226	318	386
Division Totals	466	619	788
Humanities			
English	1099	1237	1559
Germanic Lang.	230	242	296
History	672	778	875
Philosophy	88	98	136
Romance Lang.	412	538	629
Slavic Lang.		40	53
Division Totals	2501	2933	3548
Social Sciences			
Economics	238	248	345
Government	570	435	453
Psychology	487	702	803
Sociology	350	392	528
Anthropology		51	96
Division Totals	1645	1828	2225
Biological Sciences			
Botany	202	211	257
Microbiology	60	54	101
Zoology	422	445	554
Division Totals	684	710	912
Physical Sciences			
Biochemistry			59
Chemistry	552	582	598
Geology - Geography	149	165	220
Physics	169	215	283
Astronomy	51	55	68
Division Totals	921	1017	1228
Mathematics and Statistics			
Mathematics	666	790	1054
Statistics	49	90	122
Division Totals	715	880	1176
Other	2	3	-
COLLEGE TOTALS	6934	7990	9877

TABLE 9: STUDENT-TO-FACULTY RATIOS (SEPT.,1966) WITH AND WITHOUT TEACHING ASSISTANTS (TA's)

NOTE: FTE stud. = 15 undergraduate student credit hours or 8 graduate student credit hours. S/F is the ratio of the numbers in the two columns to the left. T.A. Equiv. is an arbitrarily chosen figure, $7,200 of teaching assistant funds equals one faculty position. F* is column 2 increased by column 4. S/F* is the Student Faculty ratio with teaching assistants included.

	FTE Stud.	FTE Fac.	S/F	TA Equiv.	F*	S/F*
Fine and Performing Arts						
Art	260	18	18.8	2.1	20.1	12.9
Music	142	14	10.1	1.3	15.3	9.3
Speech	386	28	13.8	1.0	29.0	13.3
Division	788	60	13.1	4.4	64.4	12.2
Humanities						
English	1559	74	21.0	14.3	88.3	17.6
Germanic Lang.	296	20	14.8	4.7	24.7	12.0
History	875	43	20.3	4.2	47.2	18.5
Philosophy	136	10	13.6	1.3	11.3	12.0
Romance Lang.	629	44	14.3	4.7	48.7	12.9
Slavic Lang.	53	6	8.8	-	6.0	8.8
Division	3548	197	18.0	29.2	226.2	12.6
Social Sciences						
Economics	345	17	20.3	3.3	20.3	17.0
Government	456	23.5	19.4	7.0	30.5	15.0
Psychology	803	23	35.0	7.0	30.0	26.8
Sociology-Anthr.	624	20	31.1	6.7	26.7	23.4
Division	2228	83.5	26.6	24.0	107.5	20.7
Biological Sciences						
Botany	257	17.25	14.9	3.7	21.0	12.2
Microbiology	101	8	12.8	2.7	10.7	9.4
Zoology	554	26	21.3	14.3	40.3	13.7
Division	912	51.25	17.8	20.75	72.0	12.6
Physical Sciences						
Biochemistry	59	5	11.8	-	5.0	11.8
Chemistry	598	35	15.3	15.0	50.0	12.0
Geology	220	13	16.9	5.0	18.0	12.2
Physics & Astronomy	351	30	11.7	11.7	41.7	8.3
Division	1228	83	14.7	31.7	114.7	10.7

TABLE 9: STUDENT-TO-FACULTY RATIOS (SEPT., 1966) WITH AND WITHOUT TEACHING ASSISTANTS (TA's)
(continued)

	FTE Stud.	FTE Fac.	S/F	TA Equiv.	F*	S/F*
Mathematics and Statistics						
Mathematics	1054	48	22.0	10.7	58.7	18.0
Statistics	122	4	30.5	1.3	5.3	23.0
Division	1176	52	22.5	12.0	64.0	18.3
COLLEGE TOTAL	9880	526.75	18.7	122.0	648.8	15.2

TABLE 10: DEGREES AWARDED

	1964-65	1965-66	1966-67
B. A.	571	674	768
B. S.	144	136	169
Total Bachelors	715	810	937
M. A.	82	121	114
M. F. A.	1	11	13
M. S.	64	108	169
Total Masters	147	240	326
Ph.D.	33[1]	42[1]	50[1]
Grand Total	895	1,092	1,313

Footnote

(1) The breakdown by major departments is shown below.

Department	1964-65	1965-66	1966-67
Botany	1	1	1
Chemistry	11*	15*	11
Economics	0	2	1
English	0	0	2
Geology	1	1	1
Government	2	1	7
History	1	0	0
Mathematics	0	0	1
Microbiology	3	0	0
Psychology	9	14	17
Sociology-Anthropology	0	2	3
Zoology	5*	6	6
Totals	33	42	50

*One of these is a 4-College Cooperative Ph.D.

TABLE 11: PERCENTAGES OF STUDENTS IN ARTS AND SCIENCES WITH CUMULATIVE AVERAGES EQUAL TO OR EXCEEDING SELECTED LEVELS, BY CLASS

	Class of			
Average	1967	1968	1969	1970
4.0	0.0	0.0	0.2	0.4
3.8	0.4	0.5	0.8	1.0
3.6	1.7	1.7	2.0	2.6
3.4	4.9	4.7	5.0	4.8
3.2	8.8	9.9	8.2	9.0
3.0	16.1	16.4	15.0	15.9
2.8	27.5	25.2	24.8	24.3
2.6	40.1	36.6	36.6	35.6
2.4	56.0	49.9	48.9	47.6
2.2	71.1	66.1	61.6	59.8
2.0	85.8	79.1	75.1	72.0
1.8	96.5	91.5	88.5	84.0
1.6	99.4	99.5	97.7	92.5
1.4	100.0	100.0	99.8	99.5
1.2			99.9	99.8
Number of Students	898	1330	1280	1562

TABLE 12: BOOKS AND MONOGRAPHS, BY DEPARTMENT AND DIVISION (1966-67)

Note: In cases of multiple authorship the name of that author who is a member of our faculty is underlined.

FINE AND PERFORMING ARTS (4)

Art (1)

Verheyen, Egon - Die Denkmaeler des Rheinlandes, Duisburg, Duesseldorf, 1966, 77, 246 figs. also published as vol. 7 of the series Duisburger Forschungen, Duisburg, 1966.

Music (3)

Fussell, Charles - Fancy's Knell for two-part chorus and piano, 8 pp.
Juilliard School of Music Repertory Project 1967

Stern, Robert - Music For Two Clarinets, 7 pp., New Valley Music Press, Smith College 1967

Folk Songs arranged for Classical Guitar, 7 pp.
Rochester Music Publishers, Inc. 1966

HUMANITIES (28)

English (10)

Aczel, Tamas, editor and co-author - Ten Years After, The Hungarian Revolution in the Perspective of History (London: MacGibbon and Kee, 1966), 253 pp. Also by Holt, Rinehart & Winston (New York, 1967).

Translation from the Russian of Irodalmi Ujsag, Poetry of the Underground (anthology), February, 1967.

Alspach, Russell, editor - The Variorum Edition of the Poems of W.B. Yeats (New York: The Macmillan Co., 1966). 3rd printing, revised.

The Variorum Edition of the Plays of W.B. Yeats (London and New York: The Macmillan Co., 1966). 2nd printing.

*Boyle, Kay - Nothing Ever Breaks Except the Heart (New York: Doubleday, 1966), 357 pp.

Golden, Morris - Fielding's Moral Psychology (University of Massachusetts Press, 1966), 171 pp.

*Visiting Lecturer, spring of 1967.

Hicks, John, editor - Thoreau in Our Season (University of Massachusetts Press, 1966), 176 pp. 2nd printing.

Manheim, Leonard and Eleanor Manheim, editors - Hidden Patterns: Studies in Psychoanalytic Literary Criticism (New York and London: Collier-Macmillan, 1966) 310 pp.

Page, Alex and Leon Barron, editors - Masterpieces of Western Literature: Contemporary Essays in Interpretation (Dubuque: Brown, 1966), 2 vols.

Rand, Frank Prentice (Professor, Emeritus) - Wordsworth's Mariner Brother (Amherst: Newell Press, 1966).

Germanic Languages (7)

*Guthke, K.S. - Wege zur Literatur, Bern: A. Francke, 1967, 280 pp.

"Friedrich von Hagedorn und das literarische Leben seiner Zeit", Jahrbuch des Freien deutschen Hochstifts, 1966, pp. 1-109.

Heller, P. and Ehrlich, E. - German Fiction and Poetry, the MacMillan Co., N.Y., 1967.

Schaefer, J. - Walther von der Vogelweide und Frauenlob, Beispiele klassischer und manieristischer Lyrik im Mittelalter, Hermaea, Germanistische Forschungen, N.F., Bd. 18; Tubingen: Max Niemeyer Verlag, 1966, x plus 335 pp.

Weigand, H. - Surveys and Soundings in European Literature, Princeton, New Jersey: Princeton University Press, 1966, viii plus 360 pp.

**Wirth, A. - Struktura sztuk Brechta, Ossolineum 1966, Wroclaw, 140 pp.

Translation into Polish of: Durremnatt, Fr., Kraksa, PIW 1966, 3rd ed.

History (4)

Chrisman, Miriam - Strasbourg and The Reform, Yale University Press, 1967, 350 pp.

Doherty, Robert - The Hicksite Separation: A Sociological Analysis of Religious Schism in Early 19th Century America, Rutgers University Press, 1967, 160 pp.

*Visiting Professor of German, spring of 1967.

**Visiting Professor of German, both semesters, 1966-67.

Greenbaum, Louis, co-author with G. Andres (Princeton) and A. Hyatt Mayor (Metropolitan Museum) - Builders and Humanists: The Renaissance Popes as Patrons of The Arts, Houston: American Philosophical Society, Philadelphia, Pa. 1966.

Philosophy (2)

Aune, Bruce - Knowledge, Mind, and Nature, Random House, Inc. 296 pp.

Moore, Edward C. - William James, Washington Square Press, 1966. 194 pp.

Romance Languages (6)

Bleiberg, German and Inman Fox, editors - Spanish Thought and Letters in the Twentieth Century. Nashville: Vanderbilt University Press, 1966. xvi, 611 pp.

de La Fontaine, Gilles - La Fountaine dans ses Fables, Montreal: Le Cercle du Livre de France, 1966. 254 pp.

Dufau, Micheline (with Elaine d'Alelio) - La decouverte du poeme. New York: Harcourt Brace and World, 1967.

Manheim, Eleanor B. - See Manheim, English.

Taylor, Robert E. (with Alain Dufour) - Bibliographie internationale de l'humanisme et de la Renaissance. I: Travaux parus en 1965. Geneve: Librairie Drox, 1966. xi, 286 pp.

Wexler, Sidney F., editor - La devocion de la cruz de Calderon de la Barca. Salamanca-Madrid-Barcelona: Biblioteca Anaya, 1966. 156 pp.

SOCIAL SCIENCES (12)

Economics (2)

Morris, Bruce R. - Economic Growth and Development, 1967 Pitman Publishing Company 529 pp.

Seligman, Ben - Most Notorious Victory: Man in an Age of Automation, 1966 Free Press. 441 pp.

Government (9)

Beth, Loren P. - The Development of Judicial Review in Ireland, 1937-1966, Institute of Public Administration, Dublin, June, 1967.

Coulter, Philip B., editor - Politics of Metropolitan Areas; New York: Thomas Y. Crowell Company, 1967, 500 pp.

Gordon, Glen - The Legislative Process and Divided Government, University of Massachusetts, Bureau of Government Research, 1966, 112 pp.

Havard, William C. and David R. Mayhew, editors - Institutions and Practices of American Government, Boston: Allyn and Bacon, Inc. 1967. 622 pp.

Howards, Irving and Edwin A. Gere, Jr. - Some Notes on Regionalism with Particular Reference to New England, University of Massachusetts, Bureau of Government Research, 1966, 16 pp.

Mayhew, David R. - Party Loyalty Among Congressmen: The Difference Between Democrats and Republicans, 1947-1962. Harvard University Press, 1966.

Two-Party Competition in the New England States, University of Massachusetts, Bureau of Government Research, 1967, 20 pp.

Reid, Jamieson S., Editor - Education: An Obligation--An Opportunity, Proceedings of the 1966 Governor's Conference on Higher Education. University of Massachusetts, Bureau of Government Research, 1966, 73 pp.

Shanley, Robert - The Problem of Simplifying the Massachusetts Constitution, University of Massachusetts, Bureau of Government Research, 1967, 40 pp.

Sociology - Anthropology (1)

Harrison, William (with Edith S. Harrison) - An Archaeological Sequence for the Hunting People of Santa Barbara, California, Annual Report University of California Archaeological Survey. Los Angeles, 1966. 89 pp.

BIOLOGICAL SCIENCES (3)

Botany (3)

Drum, R. W. - Electron Microscopy of Diatom Cells, Cramer Verlag, West Germany, 1966. 100 plates. 30 pp.

Livingston, R. B. - Guide to Spring and Summer Flora of Western New England, Second Edition. H.I. Newell Press, Amherst, Massachusetts, 1967. 113 pp.

Schuster, R. M. - The Hepaticae and Anthocerotae of North America - East of the Hundredth Meridian. Vol. 1 Columbia University Press, New York, 1966. 822 pp. Illus.

PHYSICAL SCIENCES (3)

Chemistry (3)

Brewster, R. Q. and W. E. McEwen - Organic Chemistry--A Brief Course, Japanese Translation, Prentice-Hall of Japan, 1967, 432 pp.

Hanna, J. G. and S. Siggia - Carbonyl and Derived Functions, Chapter in "Treatise on Analytical Chemistry", Kolthoff and Elving editors, vol. 13, Part II, 1966, pp. 131-223.

Siggia, S., H. Nadeau and P. Wascerziak - Nonionic Surfactants, M. J. Schick, Editor, M. Dekker Publishers, 1966, three chapters, pp. 825-891.

MATHEMATICS AND STATISTICS (0)

COLLEGE TOTAL: 42 books and monographs, 3 reprintings, 3 musical compositions and 2 translations published during 1966-67.

TABLE 13: RESEARCH AND TRAINING GRANTS AND CONTRACTS (1966-67)

NOTE: The Face Value/Year for each grant or contract in effect during 1966-67 was calculated by dividing the total face value by the number of years for which the grant or contract was awarded.

	Face Value/Year	No. of Grants and Contracts	Average Face Value/Year
Fine and Performing Arts			
Art	1,470	3	490
Music	1,075	2	538
Speech	49,300	4	12,325
Division Totals	$51,845	9	5,761
Humanities			
English	16,654[1]	13	1,281
History	155,400[2]	10	15,540[2]
Germanic Langs.	600	1	600
Slavic Langs.	500	1	500
Romance Langs.	2,400	3	800
Philosophy	600	1	600
Division Totals	$176,154	29	6,074
Social Sciences			
Economics	580	1	580
Government	29,323	10	2,932
Psychology	280,235	21	13,345
Soc-Anthr.	86,696	9	9,634
Division Totals	$396,834	41	9,679
Biological Sciences			
Botany	256,617	31	8,278
Microbiology	160,244	14	11,446
Zoology	296,546	19	15,608
Division Totals	$713,407	64	11,147
Physical Sciences			
Biochemistry	103,775	8	12,972
Chemistry	534,941	46	11,629
Geology	98,650	14	7,046
Physics and Astronomy	404,111	22	18,369
Division Totals	$1,054,577	86	12,683

TABLE 13: RESEARCH AND TRAINING GRANTS AND CONTRACTS (1966-67) (continued)

Mathematics and Statistics			
Mathematics	45,331	14	3,237
Statistics	0	0	0
Division Totals	$45,331	14	3,237
COLLEGE TOTALS	$2,438,148	243	10,223

Footnotes

(1) Professor Copeland's $189,000 grant was rated at 20 years in obtaining this total.

(2) Professor Albertson's $152,000 NDEA grant is largely responsible for this total.

TABLE 14: SELECTED PROFESSIONAL ACTIVITIES OF THE FACULTY

Division	Faculty Member	Department	Position Held
FINE & PERF. ARTS	Norton, P. F.	Art	Member, Board of Directors, Society of Architectural Historians
			Editorial Board, Journal of the Society of Architectural Historians
	Perkins, L. N.	Art	Member, Board of Directors, National Educational Council on the Ceramic Arts
	Krosnick, Joel	Music	Solo cellist in Connecticut, New York, Virginia, Mississipp Washington, D.C., and with the Harvard-Radcliffe orchestra
	Lebow, Howard	Music	Soloist and recording artist in New York, Paris, Berlin, Zurich, Frankfurt, Bologna, and with the Houston, Texas Symphony Orchestra. Soloist at the Vienna, Austria Festiva on June 9, 1967
	Steele, Ronald	Music	Guest conductor at the New Marlboro Center (Massachusetts for two weeks summer of 1966
	Hulsen, Albert	Speech	Chairman, Eastern Educational Radio Network
			Member, Program Advisory Committee of the National Educational Radio Network
	Reid, Ronald	Speech	Editorial Boards, Speech Monographs and the Journal of the American Forensic Association
	Savereid, Jay	Speech	President, New England Speech Association

Division	Faculty Member	Department	Position Held
HUMANITIES	Fleischmann, W.	Comp. Lit.	General Editor, Encyclopedia o World Literature in the Twen tieth Century
			Advisory Editor, The James Joy Quarterly
			Contributing Editor, Books Abroad
	Aho, G.	English	Chairman, Northeast Linguistic Conference
	Emerson, E.	English	Consultant, Choice
	Hicks, John	English	Co-editor, Massachusetts Review
			Executive Board, Council of Literary Magazines
	Koehler, S.	English	Director, Writer's Workshop of Chautauqua, N.Y.
	Manheim, L.	English	Editor and Publisher, Literatu and Psychology
	Mayer, M.	English	Consultant, Center for the Study of Democratic Institutions
	Politella, D.	English	President, National Council of College Publications Advisor
			Editor, The Collegiate Journalist
	Tucker, R.	English	Managing Editor, Massachusetts Review
	Cantor, M.	History	Managing Editor, Labor History
	Ilardi, V.	History	Contributing Editor, the Bibliotheque d'Humanisme et Renaissance
	Goding, S.C.	R. Lang.	Editor, Bay State Foreign Language Bulletin

Division	Faculty Member	Department	Position Held
HUMANITIES	Manheim, E.	R. Lang.	Associate Editor, Literature and Psychology
	Rothbert, I.	R. Lang.	Editor-in-chief, Hispania
	Taylor, R.	R. Lang.	Associate Editor, Renaissance Society of America
	Weiner, S.	R. Lang.	Managing Editor, The French Review
SOCIAL SCIENCES	Howard, M.C.	Economics	Editorial Staff, Journal of Marketing
	Gordon, M.	Sociology	General Editor, Minorities in American Life Series, Prentice Hall, Inc. Publishers
BIOLOGICAL SCIENCES	Davis, Edward	Botany	Consultant, NSF Undergraduate Facilities Program
	Shapiro, S.	Botany	Consultant, NSF Special Facilities Program
	Cox, C. D.	Micro.	Editorial Board, Journal of Bacteriology
			Chairman and Convenor, National Conference on Undergraduate Training in Microbiology
			Member, NASA advisory panel for environmental biology
			Member, NRC committee on Naval biomedical research
	Thorne, C. B.	Micro.	Editorial Board, Journal of Bacteriology
			Eli Lilly Award Committee

Division	Faculty Member	Department	Position Held
BIOLOGICAL SCIENCES	Fairbairn, D.	Zoology	Editorial Boards, Journal of Parasitology; Experimental Parasitology; American Journa of Epidemiology
	Honiberg, B.	Zoology	Editorial Boards, Journal of Protozoology; Transactions of the American Microscopical Society
			Chairman, U.S. Delegation to the International Commission of Protozoology
	Klingener, D.	Zoology	Associate Editor, Journal of Mammology
	Nutting, W.	Zoology	Member, Governor's Council on Conservation, Commonwealth of Massachusetts
	Sargent, T. D.	Zoology	Editorial Board, The Auk
PHYSICAL SCIENCES	McEwen, W. E.	Chemistry	National Science Foundation Advisory Panel for Organic Chemistry
			Editorial Board, Journal of Organic Chemistry
	Gluckstern, R.	Physics	Consultant and Visiting Scientist at Brookhaven National Laboratory, Los Alamos Scientific Laboratory and Lawrence Radiation Laboratory, Berkeley

TABLE 15: NEW FULL-TIME FACULTY RECRUITED (AS OF 9/7/67) ACCORDING TO RANK

Rank	Type of Position Occupied		
	New	Old	Total
Professor	11	3	14
Associate Professor	12	9	21
Assistant Professor	27	22	48[1]
Instructor	18	22	41[1]
Lecturer	2[2]	1	3
Totals	70	57	127

Footnotes

(1) Included in these totals are 14 Assistant Professors who had been appointed at this rank subject to receipt of the Ph.D. prior to September 1, 1967. The similar, "conditional" appointments of 23 other persons reverted to instructorships and are included in the 41 at that rank.

(2) Two of these appointments are at the rank of "Resident Artist".

TABLE 16: NEW FULL-TIME FACULTY RECRUITED (AS OF 9/1/67) FOR SEPTEMBER 1967 BY DIVISION, DEPARTMENT, AND RANK

Note: The number of positions of Professor, Associate Professor, Assistant Professor, Instructor and Lecturer, respectively, and the total number of positions in each department is indicated by the series of numbers in each column. Lecturers were not separately listed in 1964 and 1965; most were included with the Instructors.

Div/Dept	Type of Position Occupied: New	Old	Total
Fine and Performing Arts			
Art	0- 0- 0- 0- 1 = 1	0- 1- 1- 2- 0 = 4	0- 1- 1- 2- 1 = 5
Music	0- 0- 0- 2- 1 = 3	0- 0- 0- 0- 0 = 0	0- 0- 0- 2- 1 = 3
Speech	1- 0- 4- 2- 0 = 7	0- 0- 0- 2- 0 = 2	1- 0- 4- 4- 0 = 9
TOTALS	1- 0- 4- 4- 2 = 11	0- 1- 1- 4- 0 = 6	1- 1- 5- 8- 2 = 17
Humanities			
English	0- 0- 5- 0- 0 = 5	1- 1- 4- 3- 1 = 10	1- 1- 9- 3- 1 = 15
Germ. Lang.	1- 1- 1- 2- 0 = 5	0- 1- 0- 1- 0 = 2	1- 2- 1- 3- 0 = 7
History	0- 0- 1- 3- 0 = 4	0- 0- 3- 0- 0 = 3	0- 0- 4- 3- 0 = 7
Philosophy	0- 2- 0- 0- 0 = 2	0- 0- 0- 0- 0 = 0	0- 2- 0- 0- 0 = 2
Rom. Lang.	0- 0- 4- 5- 0 = 9	0- 0- 1- 4- 0 = 5	0- 0- 5- 9- 0 = 14
Slavic Lang.	0- 0- 0- 0- 0 = 0	0- 0- 0- 0- 0 = 0	0- 0- 0- 0- 0 = 0
Comp. Lit.	0- 0- 0- 1- 0 = 1	0- 0- 0- 0- 0 = 0	0- 0- 0- 1- 0 = 1
TOTALS	1- 3-11-11- 0 = 26	1- 2- 8- 8- 1 = 20	2- 5-19-19- 1 = 46
Social Sciences			
Economics	1- 1- 1- 1- 0 = 4	1- 1- 1- 2- 0 = 5	2- 2- 2- 3- 0 = 9
Government	1- 2- 0- 1- 0 = 4	0- 0- 2- 0- 0 = 2	1- 2- 2- 1- 0 = 6
Psychology	1- 0- 2- 0- 0 = 3	0- 0- 3- 1- 0 = 4	1- 0- 5- 1- 0 = 7
Soc-Anth	3- 2- 1- 0- 0 = 6	0- 0- 0- 1- 0 = 1	3- 2- 1- 1- 0 = 7
TOTALS	6- 5- 4- 2- 0 = 17	1- 1- 6- 4- 0 = 12	7- 6-10- 6- 0 = 29
Biological Sciences			
Botany	0- 0- 1- 0- 0 = 1	0- 0- 0- 0- 0 = 0	0- 0- 1- 0- 0 = 1
Microbiology	0- 0- 1- 0- 0 = 1	0- 0- 0- 0- 0 = 0	0- 0- 1- 0- 0 = 1
Zoology	0- 0- 1- 0- 0 = 1	0- 0- 1- 0- 0 = 1	0- 0- 2- 0- 0 = 2
TOTALS	0- 0- 3- 0- 0 = 3	0- 0- 1- 0- 0 = 1	0- 0- 4- 0- 0 = 4

TABLE 16: NEW FULL-TIME FACULTY RECRUITED (AS OF 9/1/67) FOR SEPTEMBER 1967 BY DIVISION, DEPARTMENT, AND RANK (continued)

Div/Dept	Type of Position Occupied: New	Old	Total
Physical Sciences			
Biochem	0- 0- 0- 0- 0 = 0	0- 1- 0- 0- 0 = 1	0- 1- 0- 0- 0 = 1
Geol-Geog	0- 2- 1- 0- 0 = 3	0- 0- 0- 2- 0 = 2	0- 2- 1- 2- 0 = 5
Physics-Astron	1- 2- 4- 0- 0 = 7	0- 0- 0- 0- 0 = 0	1- 2- 4- 0- 0 = 7
TOTALS	1- 4- 5- 0- 0 = 10	0- 1- 0- 2- 0 = 2	1- 5- 5- 2- 0 = 13
Mathematics and Statistics			
Math	2- 0- 0- 1- 0 = 3	1- 4- 5- 4- 0 = 14	3- 4- 5- 5- 0 = 17
Stat	0- 0- 0- 0- 0 = 0	0- 0- 1- 0- 0 = 1	0- 0- 1- 0- 0 = 1
TOTALS	2- 0- 0- 1- 0 = 3	1- 4- 6- 4- 0 = 15	3- 4- 6- 5- 0 = 18
COLLEGE TOTALS	11-12-27-18- 2 = 70	3- 9-22-22- 1 = 57	14-21-49-40- 3 =127

TABLE 17: FACULTY VACANCIES (AS OF 9/27/67)

(FTE BASIS)

Note: Faculty ranks are indicated below by the same notation used in earlier charts.

Reason for Vacancy	
Resignation, death, etc.	1.5 - 0.6 - 3.0[1] - 2.0 - 0.8 = 7.9
LWOP, etc.	2.5 - 1.5 - 4.0 - 0.0 - 0.0 = 8.0
TOTAL VACANCIES	4.0 - 2.1 - 7.0 - 2.0 - 0.8 =15.9
Vacancies used to "back up" stipends for TA's	2.5 - 2.5 - 4.0 - 0.0 - 0.0 = 8.0
EFFECTIVE VACANCIES	1.5 - 0.6 - 3.0 - 2.0 - 0.8 = 7.9

Footnote

(1) Included in this total is the position of a faculty member who is currently holding a University position outside the College.

TABLE 18: NUMBER OF UNDERGRADUATE COURSES

The table presents the number of undergraduate courses in each department previously approved plus additions and minus deletions approved during the past academic year. The number of formal courses taught in 1966-67 is presented as a fraction of the total courses. The number of seminars and special problem courses are separately listed in the last column.

Division & Field	Elementary	Advanced	Courses Taught/ Total Courses	Seminars & Special Problems
Fine and Performing Arts				
Art	5	20+1	24/25	3
Music	13+4	22+9-5	26/35	2
Speech	6	29	35/35	3
Humanities				
Classics	8	0	5/8	0
Comparative Lit.	0	7+2	4/7	0
English	7	41	48/48	5
Journ. Stud.	0	3+1	3/3	1
Germanic Langs.	9+12	20+6	21/29	2
History	4	58	50/62	2
Philosophy	5	17+1	15/22	4
Romance Langs.	32	36	53/68	4
Slavic Langs.	12	18	22/30	2+1
Social Sciences				
Asian Studies	9	3	10/12	0
Economics	2	27+1	24/29	2
Government	4	30+2	31/36	3
Psychology	4	25	27/29	4
Sociology	2	21+1	23/23	0
Anthropology	2	15+6	14/17	0
Biological Sciences				
Botany	6	14+2	16/20	1
Microbiology	3	6	8/9	4
Zoology	6	19	24/25	2
Physical Sciences				
Biochemistry	1	3+2	4/4	2
Chemistry	13	20	33/33	2
Geology	2+2	14	13/16	3
Geography	2	2	4/4	0
Physics	11	12	20/23	2
Astronomy	4+1-2	4	6/8	2
Mathematics and Statistics				
Mathematics	15	26	41/41	2
Statistics	1	9+1	8/10	0
TOTALS	188+19-2	521+35-5	617/766	57+1

TABLE 19: USE OF GRADUATE TEACHING ASSISTANTS, FALL 1966

Note: All courses in which Graduate Teaching Assistants served in the classroom are listed by department and division. The fraction indicates the extent of use in regular, discussion, or laboratory or studio courses; 7/16 means teaching assistants handled 7 of the 16 sections of this type. The number of undergraduate courses taught by each department is also indicated in the table.

Div/Dept	No. Undergrad. Courses	Course No. and Name	Type of Section: Regular	Disc.	Lab. Studio
Fine and Performing Arts					
Art	20	100 Basic Drawing			2/8
		120 Basic Design			4/7
TOTALS	20				6/15
Humanities					
English	35	111 Composition	50/126		
		112 Composition	1/6		
Germanic Lang.	13	101 Elementary	14/24		24/24
		102 Elementary	4/5		5/5
		107 Intermediate	1/17		
History	27	101 European		12/72	
		150 American		8/38	
Philosophy	9	125 Logic		11/11	
Romance Lang.	34	101 Elem. French	3/9		3/9
		102 Elem. French	1/3		3/3
		107 Inter. French	6/33		
		108 Inter. French	1/9		
		101 Elem. Italian	1/4		4/4
		101 Elem. Spanish	8/16		16/16
		102 Elem. Spanish.	2/4		4/4
		107 Inter. Spanish	4/18		
TOTALS	118		96/274	31/121	59/65
Social Sciences					
Economics	14	125 Elements of Economics	1/11	12/12	

TABLE 19: USE OF GRADUATE TEACHING ASSISTANTS, FALL 1966
(continued)

Div/Dept	No. Undergrad. Courses	Course No. and Name	Type of Section: Regular	Disc.	Lab. Studi
Social Sciences					
Government	21	100 American		39/39	
		150 European		6/6	
Psychology	15	105 General			9/9
		211 Sensation & Perception			2/2
		215 Physiological			3/3
		241 Elem. Statistics		1/1	
		245 Statistics in Psychology		1/1	
		281 Attitudes & Opinions			3/3
		301 Educa. Psych.			7/7
Sociology-Anthr.	21	101 Introductory		1/4	
TOTALS	71		1/11	60/63	24/2
Biological Sciences					
Microbiology	6	150 Introductory			2/3
		250 General			2/2
		260 General			1/1
		310 Immunology			1/1
Zoology	15	101 Introductory			49/55
		125 Animal Diver.			3/3
		135 Intro.Physiology			9/9
		137 Anatomy & Physiology			6/6
		200 Natural Hist.			5/5
		221 Comp. Vert. Anatomy			5/5
		223 Histology			5/5
		225 Develop. Biol.			2/2
		271 Inverte. Zool.			2/2
		283 Gen. Parasitology			1/1
		360 Gen. & Cellular Physiology			6/6
TOTALS	21				99/1

TABLE 19: USE OF GRADUATE TEACHING ASSISTANTS, FALL 1966
(continued)

iv/Dept	No. Undergrad. Courses	Course No. and Name	Type of Section: Regular	Disc.	Lab. Studio
ıysical Sciences					
ıemistry	18	111 General		10/40	96/96[1]
		113 General			10/12
		127 Analytical			4/4
		160 Organic			6/6
		167 Organic Lab.			6/6
		210 Quantitative Chem. Anal.			2/2
		213 Instrum. Anal.			3/3
		263 Organic Lab.			22/22
		272 Qualitative Organic Chem.			1/1
eology	9	101 Physical			22/24
		102 Historical			5/5
ıysics	12	101 Elementary			3/8
		103 Introductory			18/18
		105 General I			4/4
		106 General II			11/12
		111 Intro. (Majors)			2/4
TALS	39			10/40	215/227
athematics & Statistics					
athematics	33	Stockbridge	8/8		
		011 Elem. Alg.	1/1		
		111 Introductory	35/49		
		112 Finite Math.	6/11		
		113 Survey of Cal.	4/6		
		121 Alg. & Trig.	6/6		
		123 Calculus I	3/15		
		135 Calculus I (Eng)	12/21		
		136 Calculus II(Eng)	1/4		
		185 Cal. III (Eng)	2/9		
		200 Fund. Concepts	1/5		
TALS	33		79/135		
LLEGE TOTALS	282		176/420	101/224	397/422

Footnote

1) Sixteen of these were undergraduate laboratory assistants.

TABLE 20: ENGLISH 112 GRADE DISTRIBUTIONS OF STUDENTS WHO WERE IN "REMEDIAL" VS. "REGULAR" SECTIONS OF ENGLISH 111

	Remedial		Regular	
A	3	(11)	136	(128)
B	26	(61)	739	(704)
C	97	(79)	894	(912)
D	25	(11)	117	(131)
X	18	(7)	72	(83)
	169		1,958	

chi-sq. = 71.7

Mean	1.83	2.38

The grades in English 112 of those students who were in "remedial sections" of English 111 were significantly lower than those of students who were in "regular sections" of English 111.

TABLE 21: GRADE DISTRIBUTIONS IN COURSES IN WHICH INSTRUCTION IN SOME SECTIONS OF THE PRECEEDING COURSE WAS PROVIDED BY GRADUATE TEACHING ASSISTANTS (GTA'S)

A. Comparisons in which GTA's had some involvement in the previous course: GTA's met some discussion sections and helped in grading; other sections taught exclusively by the faculty.

	Economics 126				Government 150				History 101			
	GTA		FAC.		GTA		FAC.		GTA		FAC.	
A	2	(5)	10	(7)	19	(18)	4	(5)	18	(16)	92	(94
B	30	(30)	38	(38)	35	(35)	9	(9)	71	(79)	467	(459
C	41	(37)	42	(46)	74	(73)	19	(20)	67	(62)	352	(357
D	15	(16)	20	(19)	25	(25)	7	(7)	9	(10)	49	(50
X	5	(5)	8	(8)	5	(7)	4	(2)	6	(6)	33	(33
	93		118		158		43		172		993	
	chi-sq. = 3.98				chi-sq. = 2.70				chi-sq. = 1.86			
Mean	2.10		2.18		2.24		2.04		2.49		2.54	

B. Comparisons in which GTA's actually taught some sections of the preceeding course.

	English 112 (Remedial)		English 112 (Regular)		Sociology 102	
	GTA	FAC.	GTA	FAC.	GTA	FAC.
A	2 (2)	1 (1)	85 (93)	51 (43)	0 (0)	2 (2)
B	15 (16)	11 (10)	502 (508)	237 (231)	1 (1)	4 (4)
C	59 (61)	38 (36)	629 (615)	265 (279)	1 (3)	24 (22)
D	18 (16)	7 (9)	78 (81)	39 (36)	2 (2)	10 (10)
X	12 (11)	6 (7)	53 (50)	19 (22)	3 (1)	4 (6)
	106	63	1,347	611	7	44
	chi-sq. = 1.26		chi-sq. = 4.37		chi-sq. = 6.28	
Mean	1.78	1.90	2.36	2.42	1.57	1.77

	French 102		Spanish 102		French 108	
	GTA	FAC.	GTA	FAC.	GTA	FAC.
A	1 (.5)	3 (2.5)	14 (12)	13 (15)	14 (13)	36 (37)
B	2 (2)	14 (14)	32 (29)	32 (35)	51 (47)	126 (130)
C	1 (3)	18 (16)	31 (30)	36 (37)	55 (62)	176 (169)
D	2 (2.5)	16 (15.5)	13 (19)	29 (23)	22 (25)	71 (68)
X	5 (3)	17 (19)	22 (22)	26 (26)	15 (10)	23 (28)
	11	68	112	136	157	432
	chi-sq. = 3.52		chi-sq. = 4.70		chi-sq. = 5.56	
Mean	1.27	1.56	2.03	1.83	2.17	2.19

	Mathematics 112		Mathematics 124		Mathematics 136	
	GTA	FAC.	GTA	FAC.	GTA	FAC.
A	100 (100)	12 (12)	12 (12)	12 (12)	7 (6)	32 (33)
B	176 (178)	23 (21)	28 (28)	30 (30)	10 (10)	59 (59)
C	182 (183)	22 (21)	43 (43)	46 (46)	14 (13)	79 (80)
D	80 (81)	10 (9)	16 (17)	20 (19)	10 (9)	50 (51)
X	62 (58)	3 (7)	23 (22)	23 (24)	7 (10)	67 (64)
	600	70	122	131	48	287
	chi-sq. = 2.96		chi-sq. = 0.49		chi-sq. = 1.91	
Mean	2.29	2.44	1.92	1.91	2.00	1.79

In each of the above courses in Sections A and B there is no statistically significant difference in the distribution of grades earned by those students who were in sections of the preceeding course which were taught by GTA's as compared to those in sections which were taught by members of the faculty.

APPENDIX B

NEW FACULTY APPOINTMENTS FOR 1967-68

FINE AND PERFORMING ARTS (17)

Art (5)

Mallary, Robert W. - Associate Professor: Sculpture

Assistant Professor, University of New Mexico
Adjunct Professor, Pratt Institute.

Cheney, Iris H. - Assistant Professor: History of Art

B.A. and M.A. - Wellesley College
Ph.D. - Institute of Fine Arts, New York University
Lecturer, Smith College
Visiting Lecturer, Yale.

Grillo, John - Resident Artist: Painting

Visiting Artist, Southern Illinois University
Instructor, School of Visual Arts in New York
Visiting Artist, University of California at Berkeley
Instructor, New School for Social Research in New York
Instructor, Pratt Institute.

Lumpkins, William H. - Instructor: Ceramics

B.F.A. and M.F.A. - University of Southern California
Instructor, Mount San Antonio College.

Minisci, Brenda E. - Instructor: Ceramics

B.F.A. - Rhode Island School of Design
M.F.A. - Cranbrook Academy of Art
Art Instructor - Worcester, Massachusetts Public Secondary Schools.

Music (3)

Olevsky, Julian - Resident Artist: Violin

World-wide tours as concert violinist.

Chestnut, Walter M. - Instructor: Trumpet and Music Education

B.M. and M.M. - University of Michigan
Ed. D. candidate, University of Michigan.

Harler, Alan E. - Instructor: Choral Conducting; Vocal Music Education.
B.M. - Illinois Wesleyan University
M.M. - University of Cincinnati.

Speech (9)

Cohen, Herman - Professor: Rhetoric

B.A., M.A., and Ph.D. - University of Iowa
Assistant Professor, Associate Professor, and
Professor - University of Oregon.

Vagenas, Peter T. - Assistant Professor: Theatre-Scene Design

B.A. - Augustana College
M.A. - University of Iowa
Ph.D.- Denver University
Assistant Professor, Eastern Illinois University.

Young, Mark J. - Assistant Professor: Theatre History

A.B.-Ashbury College
M.A.- Michigan State University
Ph.D.-University of Michigan
Associate Professor and Head of Department, Taylor University.
Project Associate, University of Wisconsin.

Nerbonne, Gary P. - Instructor/Assistant Professor: Speech Science and Speech Pathology

B.S. - Central Michigan University
M.A. - Michigan State University
Candidate for Ph.D., Michigan State University.

Stewart, Gary L. - Instructor/Assistant Professor: Theatre

B.S. and M.S. - Brigham Young University
Candidate for Ph.D., University of Iowa.

Tokay, Francis H. - Instructor/Assistant Professor: Audiology

B.S. - St. Cloud State College
M.A. - Michigan State University
Candidate for Ph.D., Michigan State University.

Deboer, Carla M. - Instructor: Rhetoric

B.S. - University of Wisconsin
Candidate for M.A., Cornell University.

Elsea, Janet - Instructor: Rhetoric and Theatre

A.B. and M.A. - University of California (Davis)
Candidate for Ph.D., University of Oregon.

Leenhouts, Thelma - Instructor: Rhetoric

A.B. - Hope College
Candidate for M.A., University of Michigan.

HUMANITIES (45)

Comparative Literature (1)

Moebius, C. William - Instructor/Assistant Professor: Comparative Literature

B.A. - Lawrence University
Candidate for Ph.D., State University of New York (Buffa

English (15)

Gibson, Walker - Professor: Director, Freshman English

B.A. - Yale
M.A. - State University of Iowa
Instructor, Assistant Professor, and Associate Professor
Amherst College
Associate Professor and Professor, New York University.

Cheney, Donald S. - Associate Professor: Renaissance

B.A., M.A., and Ph. D. - Yale
Instructor and Assistant Professor, Yale
Phi Beta Kappa.

Berry, Ralph - Visiting Assistant Professor: Literature and Art

B.A., M.A., and Ph.D. - University of London
Lecturer, Lanchester College of Technology
Lecturer, Brighton College of Art.

Hunt, J. William - Assistant Professor: Comparative Literature

B.A. - Bellarmine College (Fordham)
M.A. - Fordham University
M.A. - Georgetown University
Ph.D.- Yale
Assistant Professor, Brown University.

Polletta, Gregory T. - Assistant Professor: Victorian and American Literature

B.A., M.A. - University of Connecticut
M.A., Ph.D.- Princeton
Instructor and Assistant Professor, Brown University.

Swaim, Kathleen M. - Assistant Professor: Jonathan Swift

B.A. - Gettysburg College
M.A. - Pennsylvania State University
M.A. - Middlebury College
Ph.D.- University of Pennsylvania
Assistant Professor, University of Pennsylvania.

Turner, Frederick - Assistant Professor: American Literature

B.A. - Denison University
M.A. - Ohio State University
Ph.D.- University of Pennsylvania
Assistant Professor, University of Rhode Island.

Keefe, Robert - Instructor/Assistant Professor: Victorian Literature

A.B. - Brandeis University
Candidate for Ph.D., Princeton.

Lombardi, Thomas W. - Instructor/Assistant Professor: English Romantics

B.A. - City College of New York
M.A. - Columbia University
Candidate for Ph.D., Columbia University.

Lowance, Mason I. - Instructor/Assistant Professor: Puritan Literature

B.A. - Princeton
B.A. (M.A.) - Oxford
Candidate for Ph.D., Emory University.

Meckier, Jerome T. - Instructor/Assistant Professor: Contemporary Novel

A.B. - LeMoyne College
M.A. - Harvard
Candidate for Ph.D., Harvard.

Moran, Charles - Instructor/Assistant Professor: Eighteenth Century Novel

A.B. - Princeton
A.M. - Brown University
Candidate for Ph.D., Brown University.

Nelson, John R., Jr. - Instructor/Assistant Professor: Victorian Novel

B.A. - Hamilton College
M.A. - University of Maine
Candidate for Ph.D., University of Oregon.

Tribble, Joseph L. - Instructor/Assistant Professor: American Literature

A.B. - Boston College
M.A. - Harvard
Candidate for Ph.D., Harvard.

Suvin, Darko R. - Visiting Lecturer: Dramatic Criticism

Science degree and Arts degree, University of Zagreb, Yugoslavia
Lecturer, Zagreb University.

Germanic Languages and Literatures (7)

Ryan, Lawrence - Professor: German Classicism and Romanticism

B.A. - University of Sydney
Ph.D.- University of Tubingen
Lecturer, Senior Lecturer, and Reader, University of Sydney
Visiting Lecturer, Rice University.

Reh, Albert M. - Associate Professor: Methods of Language Teaching

Ph.D. - University of Munich
Lecturer, Wayne State University
Assistant Professor, Princeton
Assistant Professor, Smith College.

Salus, Peter H. - Associate Professor: Linguistics

B.A., M.A., and Ph.D. = New York University
Instructor and Assistant Professor, Germanic Languages, Queens College
Visiting Lecturer, New York University
Assistant Professor and Chairman, Linguistics, Queens College.

Waldeck, Peter B. - Assistant Professor: Modern German Literature

B.A. - Oberlin College
M.A. and Ph.D. - University of Connecticut.

Cathey, James E. - Instructor/Assistant Professor: Germanic Philology

B.S. - Oregon State College
M.A. - Universität Hamburg
Candidate for Ph.D., University of Washington.

Ohlendorf, Harald - Instructor/Assistant Professor: Goethe

B.A. - Queens University
M.A. - Stanford University
Candidate for Ph.D., Stanford University.

Seelig, Harry E. - Instructor/Assistant Professor: Literature and Music

A.B. and B.M. - Oberlin College
M.A. - University of Kansas
Candidate for Ph.D., University of Kansas.

1

History (6)

Boyer, Paul - Assistant Professor: American Intellectual Histor

A.B., M.A., and Ph.D. - Harvard
Assistant Editor: Notable American Women
Phi Beta Kappa.

Dubofsky, Melvyn - Assistant Professor: United States History

B.A. - Brooklyn College
Ph.D.- University of Rochester
Assistant Professor, Northern Illinois University
Phi Beta Kappa.

Sarti, Roland - Assistant Professor: Modern European History

B.A. - City College of New York
M.A. and Ph.D. - Rutgers University.

Tager, Jack - Assistant Professor: United States History

B.A. - Brooklyn College
M.A. - University of California (Berkeley)
Ph.D.- University of Rochester
Instructor, Ohio State University.

Levy, Richard - Instructor/Assistant Professor: German History

A.B. - University of Chicago
M.A. - Yale
Candidate for Ph.D., Yale
Phi Beta Kappa.

Bernstein, Richard - Instructor: Modern European History

B.A. - Brown University
Candidate for Ph.D., Princeton.

Philosophy (2)

Gettier, Edmund L. III - Associate Professor: Contemporary Philosophy

B.A. - Johns Hopkins University
Ph.D.- Cornell University
Instructor, Assistant Professor, and Associate Professor, Wayne State University.

Heidelberger, Herbert - Associate Professor: Metaphysics

A.B. - New York University
A.M. - University of Minnesota
Ph.D.- Princeton
Assistant Professor, Brown University.

Romance Languages (14)

Calvert, Laura D. - Assistant Professor: Spanish

B.A. and M.A. - University of New Mexico
Ph.D. - Ohio State
Assistant Professor, University of New Mexico

Hanrez, Marc - Assistant Professor: French Language and Literature

B-es-L, L-es-L (M.A.), Agrégation (Ph.D.), Free University of Brussels.

Lawall, Gilbert W. - Assistant Professor: Latin and Greek

A.B. - Oberlin College
Ph.D.- Yale
Instructor, Yale
Assistant Professor, Amherst College.

Deaver, Jack W. - Instructor/Assistant Professor: French Language and Literature

B.A. - Southwestern at Memphis College
M.A. - Princeton
Candidate for Ph.D., Princeton.

Gugli, William V. - Instructor/Assistant Professor; French Language and Literature
A.B. and M.A. - Brown University
Candidate for Ph.D., Syracuse University.

Soper, Cherrie L. - Instructor/Assistant Professor: Spanish

B.A. - Ursinus College
M.A. - University of Kansas
Candidate for Ph.D., University of Kansas.

Guillumette, Doris - Instructor: French Language and Literature

B.A. - Barnard College
M.A. - Middlebury College.

Lee, Sonia M. - Instructor: French

B.S. - Wisconsin State College
M.A. - University of Wisconsin
Candidate for Ph.D., University of Massachusetts.

MacLeod, Sabra R. - Instructor: Spanish Language

B.A. - Smith College
Candidate for M.A., Smith College

Mudge, Charles R. - Instructor: French Language and Literature

B.A. - State University of New York (Albany)
M.A. - Indiana University
Candidate for Ph.D., Indiana University.

Pollock, Seymour - Instructor: Spanish Language and Literature

A.B. and A.M. - Middlebury College
Candidate for Ph.D., University of Massachusetts.

Six, Gilles J. - Instructor: French Language and Literature

Certificate d'Etudes Littéraires Générales Moderne
Certificate de Philologie Anglaise
Certificate d'Etudes Pratiques d'Anglais
Certificate de Littérature et Civilisation Américaines
University of Caen
Candidate for Ph.D., University of Massachusetts.

Tedeschi, Richard - Instructor: French

B.A. - Ithaca College
M.A. - Rutgers University
Candidate for Ph.D., University of Massachusetts.

Terrizzi, Anthony R. - Instructor: Italian Language and Literature

B.A. - Rutgers University
Candidate for Ph.D., Rutgers University.

Slavic Languages and Literatures

No appointments.

SOCIAL SCIENCES (28)

Economics (9)

Barkin, Solomon - Professor and Research Associate with Labor Relations and Research Center: Labor

B.S. - College of City of New York
M.A. - Columbia University
Director and Head Social Affairs Division, Manpower and Social Affairs Directorate, O.E.C.D., Paris
Phi Beta Kappa.

Slitor, Richard E. - Professor: Public Finance

S.B. - Harvard
M.A. - Colgate University
Ph.D.- Harvard
Instructor, Radcliffe College
Associate Professor and Chairman of Department, Mount Union College
Economist with Treasury Department
Assistant Director, Office of Tax Analysis
Phi Beta Kappa.

Eagly, Robert V. - Associate Professor: European Economic History

A.B. - University of Michigan
M.A. - University of Washington
Ph.D.- Rutgers University
Assistant Professor and Associate Professor, Wayne State University.

Kindahl, James K. - Associate Professor: Econometrics

A.B., M.B.A., and Ph.D. - University of Chicago
Assistant Professor, Johns Hopkins University
Associate Professor, Amherst College
Lilly Faculty Fellow, University of Chicago
Visiting Associate Professor, University of Chicago
Phi Beta Kappa.

Gale, Bradley T. - Instructor/Assistant Professor: Industrial Organization and Mathematical Economics

B.S. - Worcester Polytechnic Institute
M.A. - University of Massachusetts
Candidate for Ph.D. - Rutgers University

Gunderson, Gerald A. - Instructor/Assistant Professor: American Economic History

B.A. and M.A. - University of Washington
Candidate for Ph.D., University of Washington.

Hinckley, Robert- Instructor/Assistant Professor: Money and Banking

B.A. and M.A. - University of Massachusetts
Candidate for Ph. D., Cornell University.

Love, Thomas - Instructor/Assistant Professor: Labor Economics

B.S. - Wisconsin State University
M.S. - University of Wisconsin
Candidate for Ph.D., University of Wisconsin.

Ray, Cadwell L. - Instructor/Assistant Professor: Public Finance

B.S. - Texas A & M College
M.S. - University of Texas
Candidate for Ph.D., University of Texas.

Government (6)

Fliess, Peter J. - Professor: International Law and Relations

B.A. - Stanford University
M.A., and Ph.D. - Harvard
Assistant Professor, Associate Professor and Professor,
Louisiana State University
Phi Beta Kappa.

Booth, David A. - Associate Professor and Research Associate,
State, metropolitan government: Bureau of
Government Research

B.Sc. - London School of Economics
M.A. and Ph.D. - University of Virginia
Instructor and Assistant Professor, Vanderbilt University
Assistant Professor, Michigan State
Associate Professor, University of Kentucky
Phi Beta Kappa.

King, Jerome B. - Associate Professor: Political Theory

A.B. - Dartmouth College
A.M. and Ph.D. - Stanford University
Instructor, Middlebury College
Lecturer, Assistant Professor, Williams College.

Alfange, Dean Jr. - Assistant Professor: Public Law

A.B. - Hamilton College
M.A. - University of Colorado
Ph.D.- Cornell University.

Sulzner, George T. III - Assistant Professor: Political Parties
and the Political Process

B.A. - Muskingum College
M.A. - University of Michigan
Ph.D.- University of Michigan

Mileur, Jerome M. - Instructor and Research Associate, Bureau of Government Research: State and Local Government

B.A. - Southern Illinois University
M.A. - University of Illinois
Candidate for Ph.D., Southern Illinois University.

Psychology (7)

Appley, Mortimer H. - Professor and Head of Department: Experimental Motivation

B.S.S. - The City College of New York
M.A. - University of Denver
Ph.D. - University of Michigan
Assistant Professor, Wesleyan University
Associate Professor, Professor and Chairman, Connecticut College
Professor and Chairman, Southern Illinois University
Professor and Chairman, York University
Dean, Graduate School, York University.

Ayres, John J.B. - Assistant Professor: Operant Conditioning

B.A. - College of William and Mary
M.A. and Ph.D. - University of Kentucky
Instructor, Boston University.

Eagly, Alice H. - Assistant Professor: Social Psychology

A.B. - Radcliffe College
M.A. and Ph.D. - University of Michigan
Assistant Professor, Michigan State
Phi Beta Kappa.

Biller, Henry B. - Instructor/Assistant Professor: Child Clinica

A.B. - Brown University
Candidate for Ph.D., Duke University
Phi Beta Kappa.

Chumbley, James I. - Instructor/Assistant Professor: Verbal Learning and Concept Formation

A.B. - Drake University
M.S. - Indiana University
Candidate for Ph.D., Indiana University
Phi Beta Kappa.

Kamil, Alan C. - Instructor/Assistant Professor: Animal Learning

B.A. - Hofstra College
M.S. - Wisconsin University
Candidate for Ph.D., Wisconsin University.

Willoughby, Robert H. - Instructor/Assistant Professor: Child Psychology

B.A. - Gettysburg College
M.S. - University of Pittsburgh
Candidate for Ph.D., University of Minnesota.

Sociology - Anthropology (6)

Page, Charles H. - Professor: Sociological Theory

A.B. - University of Illinois
Ph.D.- Columbia University
Lecturer, Columbia University
Assistant Professor, Professor, Smith College
Visiting Professor, University of California (Berkeley)
Professor and Chairman, City College of New York
Professor and Chairman, Smith College
Professor and Chairman, Princeton
Professor and Provost, Adlai E. Stevenson College, University of California (Santa Cruz).

Prufer, Olaf H. - Professor: New World Prehistory and Archaeology

B.A., M.A. and Ph.D. - Harvard
Assistant Professor, Associate Professor, Case Institute of Technology
Research Associate, Carnegie Museum
Phi Beta Kappa.

Halpern, Joel M. - Associate Professor: General Ethnology

B.A. - University of Michigan
Ph.D.- Columbia University
Assistant Professor, University of California (Los Angeles)
Associate Professor, Brandeis University
Associate, Russian Research Center, Harvard.

Pi-Sunyer, Oriol - Associate Professor: Social and Economic Change

B.A. - Mexico City
A.M. and Ph.D. - Harvard
Assistant Professor, Case Institute of Technology.

Munn, Nancy D. - Assistant Professor: Cultural Anthropology

B.A. - University of Oklahoma
M.A. - Indiana University
Ph.D.- Australian National University
Faculty Member, Bennington College.

Barber, G. Putnam - Instructor/Assistant Professor: Demography

B.A. - Haverford College
M.A. - University of Pennsylvania
Candidate for Ph.D., University of Pennsylvania.

BIOLOGICAL SCIENCES (4)

Botany (1)

Mulcahy, David L. - Assistant Professor: Genecology

A.B. - Dartmouth College
Ph.D.- Vanderbilt University
Assistant Professor, University of Georgia
Visiting Assistant Ecologist, Brookhaven National Laboratory.

Microbiology (1)

Lessie, Thomas G. - Assistant Professor: Microbial Physiology

B.S. - Queens College
A.M. and Ph.D. - Harvard
N.I.H. Postdoctoral Fellow, Oxford
N.I.H. Postdoctoral Fellow, Purdue University
N.I.H. Postdoctoral Fellow, University of Washington
Phi Beta Kappa.

Zoology (2)

Kaulenas, Mindaugas S. - Assistant Professor: Cell Biology and Physiology

B.Sc. and Ph .D. - University of London
Postdoctoral Fellow, University of Massachusetts.

O'Connor, W. Brian - Instructor/Assistant Professor: Physiology

B.A. - St. Michael's College
M.S. - Purdue University
Candidate for Ph.D., Purdue University.

PHYSICAL SCIENCES (13)

Biochemistry

No appointments.

Chemistry (1)

Miller, Bernard - Associate Professor: Organic

B.S. - City College of New York
M.A. and Ph.D. - Columbia University
N.S.F. Postdoctoral Fellow, N.I.H. Postdoctoral Fellow, University of Wisconsin
Senior Research Chemist, American Cyanamid Company.

Geology and Geography (5)

Bromery, Randolph W. - Associate Professor: Geophysics

B.S. - Howard University
M.S. - American University
Candidate for Ph.D., Johns Hopkins University.

Hartshorn, Joseph H. - Associate Professor: Pleistocene and Glacial Geology

S.B., M.A., and Ph.D. - Harvard
Visiting Lecturer, University of Michigan
Assistant to Branch Chief, Branch of Regional Geology in New England, U.S. Geological Survey.

Hall, Leo M. - Assistant Professor: Petrology

B.S. - St. Lawrence University
M.S. - University of Cincinnati
Ph.D.- Harvard
Assistant Professor, Union College.

Nostrand, Richard L. - Instructor/Assistant Professor: Historical Geography

B.A. - University of Washington
M.A. - University of California (Los Angeles)
Candidate for Ph.D., University of California (Los Angeles)

Wilkie, Richard W. - Instructor/Assistant Professor: Cartography

B.A. and M.A. - University of Washington
Candidate for Ph.D., University of Washington.

Physics and Astronomy (7)

Strong, John D. - Professor: Infrared Astronomy

A.B. - University of Kansas
M.S. and Ph.D. - University of Michigan
Fellow, California Institute of Technology
Fellow, 200-inch telescope project, Mount Palomar
Research Fellow, Harvard
Professor, Johns Hopkins University
Professor and Director, Laboratory of Astrophysics and Physical Meteorology, Johns Hopkins University
Phi Beta Kappa.

Brehm, John J. - Associate Professor: High Energy Theory

B.S. - University of Maryland
M.S. - Cornell University
Ph.D.- University of Maryland
N.S.F. Postdoctoral Fellow, Princeton
Assistant Professor and Associate Professor, Northwestern University.

Goldenberg, H. Mark - Associate Professor: Experimental Astrophysics and Atomic Physics

Ph.D. - Harvard
N.S.F. Postdoctoral Fellow, Heidelberg
Instructor and Assistant Professor, Princeton.

Golowich, Eugene - Assistant Professor: High Energy Theory

B.S. - Rensselaer Polytechnic Institute
Ph.D.- Cornell University
Instructor, Cornell University
Research Associate, Carnegie Institute of Technology.

Mullin, William J. - Assistant Professor: Solid State Theory

B.S. - St. Louis University
Ph.D.- Washington University (St. Louis)
Research Associate, University of Minnesota.

Plummer, William T. - Assistant Professor: Laboratory Astrophysics and Balloon Astronomy

B.A. and Ph.D. - Johns Hopkins University
Captain, Scientific Intelligence, U.S. Army
Phi Beta Kappa.

Swift, Arthur R. - Assistant Professor: High Energy Theory

B.A. - Swarthmore College
Ph.D.- University of Pennsylvania
Research Associate, Cambridge University
Research Associate, University of Wisconsin.

MATHEMATICS AND STATISTICS (16)

Mathematics (15)

Stone, Marshall H. - George David Birkhoff Professorship (effective September 1, 1968)

A.B., A.M. and Ph.D. - Harvard
Instructor, Assistant Professor, Associate Professor, and Professor and Chairman, Harvard
Associate Professor, Yale
Chairman and Andrew MacLeish Distinguished Service Professor, University of Chicago
Phi Beta Kappa
National Academy of Sciences.

Cohen, Haskell - Professor: Dimension Theory

A.B. - University of Omaha
M.S. - University of Chicago
Ph.D.- Tulane University
Instructor, University of Tennessee
Assistant Professor, Associate Professor, and Professor, Louisiana State University.

Maeda, Shuichiro - Visiting Professor: Algebra

B.S. - Osaka University
D.Sc.- Hiroshima University
Instructor and Assistant Professor, Hiroshima University
Professor, Ehime University.

Hayes, David R. - Associate Professor: Algebra and Algebraic Geometry

A.B. and Ph.D. - Duke University
Assistant Professor and Associate Professor, University of Tennessee
N.S.F. Fellow, Harvard.

Holland, Samuel S. - Associate Professor: Algebra

B.S. - Massachusetts Institute of Technology
M.S. - University of Chicago
Ph.D.- Harvard
Assistant Professor and Associate Professor, Boston College

Janowitz, Melvin F. - Associate Professor: Algebra

B.A. - University of Minnesota
Ph.D.- Wayne State University
Assistant Professor, University of New Mexico
Associate Professor, Western Michigan University.

Buckley, Joseph T. - Assistant Professor: Homological Algebra

B.S. - Boston College
Ph.D.- Indiana University
John Wesley Young Research Instructor, Dartmouth College.

Cook, Thurlow A. - Assistant Professor: Analysis

A.B. - University of Rochester
M.A. - University of Buffalo
Ph.D.- Florida State University.

Schreiner, Erik A. - Visiting Assistant Professor: Algebra

B.A., M.A., and Ph.D. - Wayne State University
Assistant Professor, Western Michigan University.

Crown, Gary D. - Instructor/Assistant Professor: Algebra

B.A. and M.A. - Wichita State University
Candidate for Ph.D., Western Michigan University.

Douglass, Roger T. - Instructor/Assistant Professor: Relation Theory

B.A. - University of Kansas
M.A. - Michigan University
Candidate for Ph.D., University of Kansas
Phi Beta Kappa.

Hertz, Douglas N. - Instructor/Assistant Professor: Differential Topology

B.S. - Massachusetts Institute of Technology
M.A. - Brandeis University
Candidate for Ph.D., Brandeis University.

Salter, Kathleen C. - Instructor/Assistant Professor: Algebra

B.S. - University of Detroit
M.S. - Northwestern University
Candidate for Ph.D., Northwestern University.

Gold, Hyla E. - Instructor: Undergraduate Teaching

B.A. - Clark University
M.A. - University of Massachusetts.

Lieb, Barbara T. - Instructor: Undergraduate Teaching

B.S. - Bucknell University
M.S. - University of Massachusetts.

Statistics (1)

Kleyle, Robert M. - Instructor/Assistant Professor: Statistical Inference

B.A. - Duquesne University
M.S. - University of Pittsburgh
Candidate for Ph.D., Harvard.

ADDENDUM

Sociology-Anthropology

Edding, Friedrich - Visiting Professor: Sociology of Education

B.A. - Kiel University
Ph.D.- Kiel University
Staff member, Central Statistical Office, Berlin
Staff member, Institute of World Economics, Univ. of Kiel
Research Professor, Institute for International Education Research, Frankfurt
Professor, Technical University, Berlin

Mathematics

Randall, Charles H. - Associate Professor: Foundations of Empirical Science

B.S.M.E. - Polytechnic Institute of Brooklyn
M.S. - University of Pittsburgh
Ph.D. - Rensselaer Polytechnic Institute
Scientist and Termal Engineer, Westinghouse Atomic Power Division
Nuclear Specialist, Martin Co., Nuclear Division
Staff Physicist and Reactor Physicist, General Electric Company

Skinner, Jonathan B. - Instructor: Informal Geometry

B.A. - Carleton College
M.A. - University of Michigan

A N N U A L R E P O R T

School of Home Economics
University of Massachusetts

July 1, 1966-June 30, 1967.

Submitted by: Marion A. Niederpruem

Marion A. Niederpruem, Dean

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I. APPROPRIATIONS

1964-65	$ 31,867.15
1965-66	27,635.00
1966-67	36,653.00

II. PERSONNEL

a. RANK	Sept. 1964	Sept. 1965	Sept. 1966
Professors (including School Head)	2	2	2
Professors "A"	1 (12% time)	1 (50% time)	4
Associate Professors	6	4	4
Associate Professors"A"	2 (12% time)	4 (2 10% time)	7
Assistant Professors	6 (1 25%) (1 75%) (3 100%) (1 100% res.)	6 (1 25%)	6
Assistant Professors"A"	1 (12% time)	-	1
Instructors	3	2	2
Lecturers (part time)	2	3	4
	22	22	30

N.B. As of July 1, 1966, extension personnel became part of the School of Home Economics. Of the "A" positions (9) are extension and (2) are research and teaching.

b. FACULTY ON LEAVE

Edward K. Knapp - 1/4 time, Feb. 1 - June 1, 1967.

Helen R. Vaznaian - Full time, Sept. 1, 1966 - Jan. 30, 1967
2/3 time, Feb. 1, 1967 - July 1, 1967.

c. APPOINTMENTS, PROMOTIONS & MERIT INCREASES

Appointments:	Rank	Effective Date
Dr. A. Raymond Cellura	Head, Human Development	2/5/67
Verda M. Dale	Head, Management & Family Economics	"
Dr. Elwood F. Reber	Head, Nutrition & Food	"
Helen R. Vaznaian	Head, Home Economics Education	"
Promotions		
Dr. A. Raymond Cellura	Associate Professor	"
Merit Increases		
Dr. Mark H. Bert		"
Dr. A. Raymond Cellura		"
Gladys M. Cook		"
Verda M. Dale		"
Virginia Davis		"
Winifred I. Eastwood		"
Sarah L. Hawes		"
Dr. Mary E. Lojkin		"
Rosa S. Johnston		"
Marjorie M. Merchant		"

Merit Increases (contd)	Effective Date
Dr. Elwood F. Reber	2/5/67
Anna Russell	"
Marjorie F. Sullivan	"
Helen R. Vaznaian	"
Harriet J. Wright	"

d. RESIGNATIONS

Dr. A. Raymond Cellura - As Head of Department	6/15/67

e. RETIREMENTS

None.

UNIVERSITY OF MASSACHUSETTS
SCHOOL OF HOME ECONOMICS

ORGANIZATIONAL PATTERN FOR SCHOOL

TEACHING-RESEARCH-EXTENSION

NUTRITION AND FOOD

Chairman - Dr. E. Reber
- Dr. M. Bert
- R. Boicourt
- G. Cook
- D. Davis
- Dr. M. Lojkin
- J. McCullough
- Dr. E. Rust
- H. Wright

TEXTILES, CLOTHING & ENVIRONMENTAL ART

Acting Chairman - Dr. M. Niederpruem
- C. Crow
- V. Davis
- R. Hanson
- S. Hawes
- R. Johnston
- H. Paston

MANAGEMENT AND FAMILY ECONOMICS

Chairman - V. Dale
- B. Higgins
- E. Knapp
- M. Merchant

HUMAN DEVELOPMENT

Chairman - Dr. A. R. Cellura
- J. Burroughs
- M. Fernandes
- E. Olim

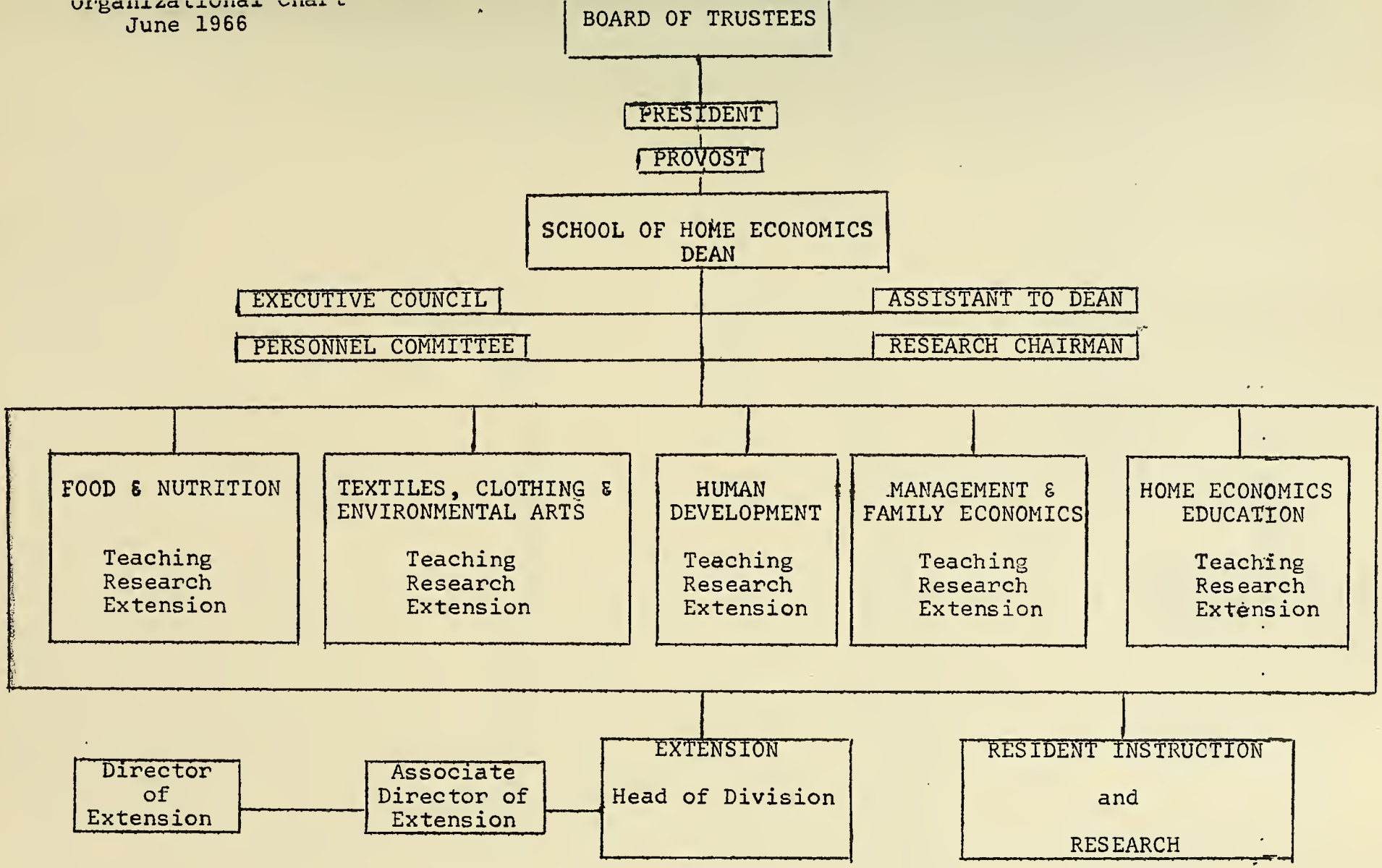
Staff
- M. Aninger
- H. Harvey
- A. Russell
- R. Smith

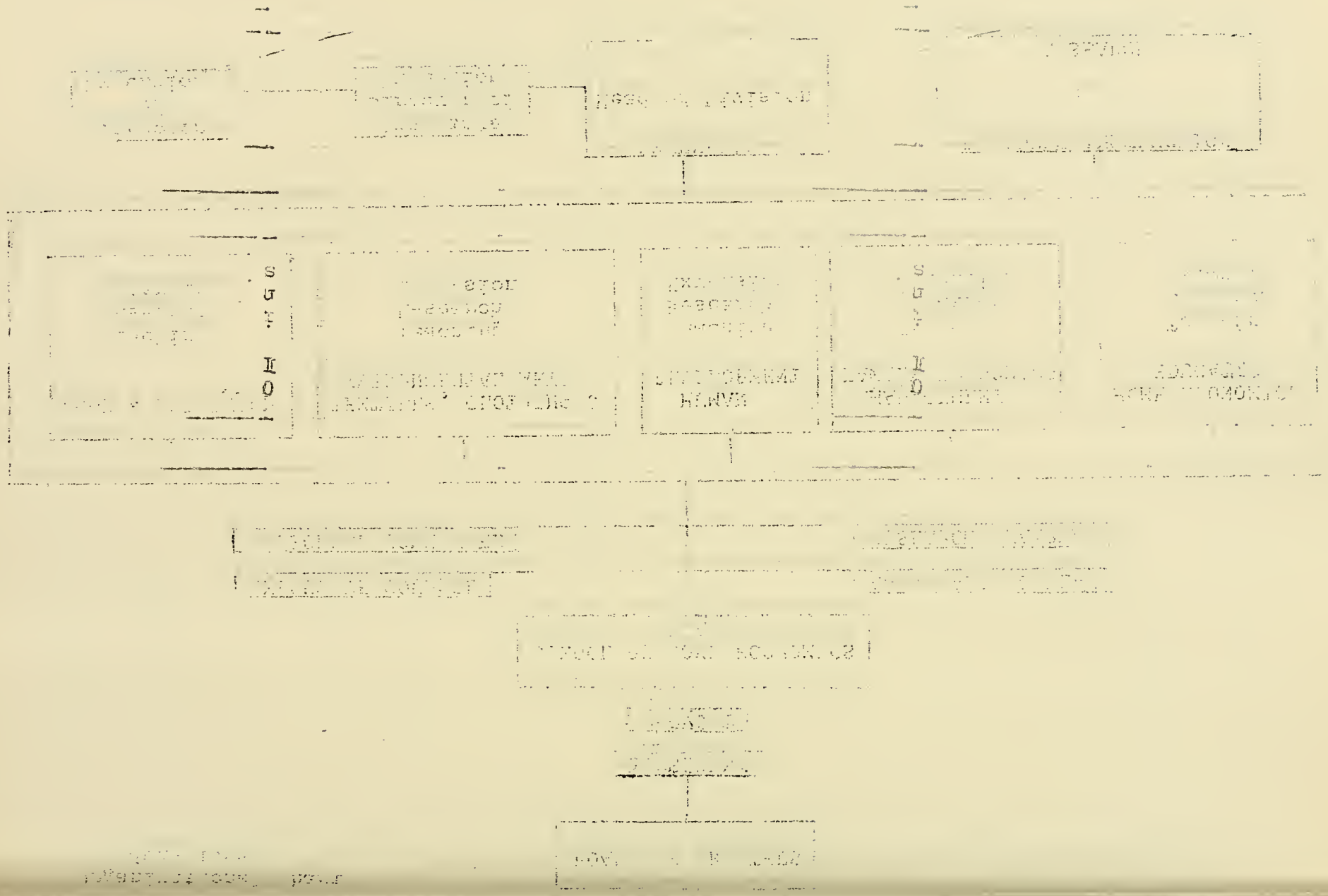
HOME ECONOMICS EDUCATION

Chairman - H. Vaznaian
- W. Eastwood
- M. Sullivan

9/1/66:m

Organizational Chart
June 1966





IV. STUDENTS

	Sept. 1964	Sept. 1965	Sept. 1966
a. Number of majors, undergrad.	213	289	387
Number of majors, graduate	7	17	26

	1964		1965		1966	
	1st	2nd	1st	2nd	1st	2nd
b. No. students taught each sem. (undergrad. & graduate)	559	644	861	783	1135	1312
No. of non-majors	118	252	246	266	299	411
No. of courses offered	26	27	29	25	38	45

c. Current data on enrollment figures - see pages 7 and 8.

SCHOOL OF HOME ECONOMICS

ENROLLMENT BY MAJORS

CHILD DEVELOPMENT

Upperclassmen	- 76	Class of 1967	-	17
Transfers from other Institutions	- 2	Class of 1968	-	38
Freshmen	- 19	Class of 1969	-	22
	97	Class of 1970	-	19
		Non-classified	-	1
				97

DIETETICS AND INSTITUTIONAL ADMINISTRATION

Upperclassmen	- 20	Class of 1967	-	7
Transfers from other Institutions	- 2	Class of 1968	-	4
Freshmen	- 18	Class of 1969	-	9
	40	Class of 1970	-	20
				40

NUTRITION AND FOODS IN BUSINESS

Upperclassmen	- 10	Class of 1967	-	2
Freshmen	- 2	Class of 1968	-	1
	12	Class of 1969	-	7
		Class of 1970	-	2
				12

HOME ECONOMICS EDUCATION

Upperclassmen	- 48	Class of 1967	-	10
Transfers from other Institutions	- 6	Class of 1968	-	19
Freshmen	- 14	Class of 1969	-	22
	68	Class of 1970	-	15
		Non-classified	-	2
				68

TEXTILES, CLOTHING AND ENVIRONMENTAL ARTS

Upperclassmen	- 94	Class of 1967	-	13
Transfers from other Institutions	- 18	Class of 1968	-	40
Freshmen	- 53	Class of 1969	-	54
	165	Class of 1970	-	58
				165

ENROLLMENT BY MAJORS

Child Development	-	97
Dietetics and Institutional Administration	-	40
Nutrition and Foods in Business	-	12
Home Economics Education	-	68
Textiles, Clothing and Environmental Arts	-	165
TOTAL ENROLLMENT		387

:H / 9/9/66

SCHOOL OF HOME ECONOMICS UNDERGRADUATE ENROLLMENT

FALL 1961 -- FALL 1966

Fall Semester 1961-62		
Freshman		- 26
Sophomore		- 34
Junior		- 26
Senior		- 30
	Total	116
Fall Semester 1962-63		
Freshman		- 37
Sophomore		- 32
Junior		- 40
Senior		- 28
	Total	137
Fall Semester 1963-64		
Freshman		- 62
Sophomore		- 44
Junior		- 35
Senior		- 36
	Total	177
Fall Semester 1964-65		
Freshman		- 74
Sophomore		- 63
Junior		- 40
Senior		- 33
Non-Classified		- 3
	Total	213
Fall Semester 1965-66		
Freshman		-101
Sophomore		- 94
Junior		- 53
Senior		- 36
Non-Classified		- 5
	Total	289
Fall Semester 1966-67		
Freshman		-114
Sophomore		-111
Junior		-109
Senior		- 49
Non-Classified		- 4
	Total	387

Percentage of Increase - Fall 1961 to Fall 1966 ---------- 233.62%

7/10/67:h

V. PROFESSIONAL ACTIVITIES
VI. MAJOR ACCOMPLISHMENTS
VII. SPECIAL PROJECTS
VIII. FUTURE PLANS AND NEEDS

These topics have been considered in each of the department reports which follow. However, some items which do not appear and other items which need to be emphasized, are summarized herewith.

Departmentalization

Departmentalization was accomplished when approval was granted by the Board of Trustees in December 1966. During the year, each department had been given budgetary figures for the various accounts. A new bookkeeping system was introduced in the School office so that all departmental expenditures could be kept separate. Beginning July 1, 1967, the Nutrition and Food Department will have a separate code number so that they will get monthly control registers. Other departments are not ready for this because their budgets are so small that the main office can, at this stage of the School's development, keep the records of expenditures for each.

Previous to departmentalization we had been organized into areas with chairmen and had functioned as departments so that this new development warranted no particular changes. Duties of Heads had been delineated and appointment criteria listed in the School of Home Economics Faculty Manual. During the year, the Executive Council of the School spent approximately seven two-hour sessions discussing the duties of the Dean and the Heads, and the relationship between these administrators. This was done so that the transition to departmentalization would be smooth and effective.

Executive Council

The Executive Council met twice a month for morning sessions during the year. The School's operations were discussed and new policies and procedures were developed as needs arose. Short range and long range plans for the School's development were discussed, and implemented when possible. The Executive Council members have functioned as a closely knit working group and have been most helpful to the Dean.

Doctoral Program

The approval of the Board of Trustees for a doctoral program in Nutrition and Food was granted in September 1966. This is the first doctoral program in this subject matter area in New England. The program needs to be supported by additional laboratory facilities so that research in this field can be expanded to meet the needs of graduate students.

Five-Year Developmental Plans

The departments are in the second year of implementing their Five-Year Developmental Plans. These were submitted in the 1965-66 report. Progress has been made in all departments and is reported in the ensuing materials. However, a great deal of support is needed for each department's development and this is in terms of more financial assistance for operation, new facilities (laboratories and classrooms), and new faculty. The growth and expansion of the School is dependent on each department developing to its fullest potential. The Nutrition and Food Department has made the most progress in its development due to the fact that they have had the most support in all areas, and they have a good Head who works with the faculty on the development of the department.

Continuing Education

The School is just beginning to make an educational contribution to the Home Economics teachers of the State. Spring Term, a seminar in Curriculum and Methods in Home Economics (HEEd 682) was offered in Pittsfield. Mrs. Marjorie Sullivan taught this course to 29 graduate students. The same course is being offered by Helen Vaznaian in Boston this summer as a part of our Summer School program. In the fall term, this same course will be given in Arlington. In each instance it is being offered for the Home Economics teachers in the State. Our Home Economics Education Department has a real challenge to meet the needs of this group throughout the State. Besides the course we are now offering, we should be offering courses in all the subject matter areas of Home Economics. This we will do as soon as we have the faculty to do this.

Graduate Work in Home Economics

In the State of Massachusetts, we have a great need for people to obtain a master's degree in Home Economics with subject matter concentration in one of the five areas. More and more home economics teachers and school administrators are becoming aware of the need for graduate studies in Home Economics. Teachers are applying for course work at the graduate level as well as expressing the desire to become involved in a degree program at our School of Home Economics. At this time we are providing a stimulating course in Curriculum and Methods in Home Economics (HEEd 682) to improve their competencies in this area. This course has been offered in Amherst and Pittsfield and will be offered in Boston and Arlington. All of the students taking this course already have degrees, some have master's, others are interested in beginning a master's degree program at the University.

Throughout the state there is a real need to offer graduate courses in various areas in the five subject matter fields. By so doing we will be making a real educational contribution to the state.

Our graduate course work and program in Home Economics on the Amherst campus continues to be evaluated and strengthened. As the departments develop, they will be able to offer greater depth and breadth of subject matter for concentration in a field. We now have nine students who will complete their master's degree in Home Economics in the 1967-68 academic year. (This is exclusive of Nutrition and Food graduate students).

Dr. John O'Neill, Associate Commissioner of Education, has been working with Helen Vaznaian regarding innovative graduate programs in home economics for teachers throughout the state. He is desirous of our helping these teachers to function more effectively through advanced graduate studies. Dr. O'Neill expects us to exert greater influence upon graduate preparation of home economics teachers, as well as provide leadership for Home Economics Education at the secondary and post-secondary school levels.

Laboratory, Classroom and Office Situation

The School of Home Economics, due to its increase in enrollment and its development, has had to deny people courses and keep enrollment in courses limited to the laboratory space and faculty that were available. This is discouraging to the staff as they are desirous of meeting the needs of students. The School wants to develop to its fullest potential and meet all the needs of students.

The Home Management laboratory is hopefully to be in Hampshire House as is one phase of the Home Economics Education laboratory. Room for the remaining laboratory space for the latter must be secured and renovated and equipped. This is delineated in the appendix. The Human Development offices and a laboratory are now in the Hampshire House.

It has been necessary for us to hold some of our lecture classes in other buildings because of the size of the classes and the crowded condition of our two classrooms.

We now need another clothing construction laboratory and en environmental arts laboratory. We have no place to put all the classes that are required in our programs. In addition, we need a nutrition laboratory for class use and research activities. The need for new laboratory space is now. Having laboratories outside of Skinner Hall will be a handicap due to the fact that considerable illustrative material will have to be duplicated.

We have no space to accommodate half of our graduate students who are working on assistantships. No office or work space is available. No office space is available for new faculty. They will have to be put in other buildings outside of Skinner Hall.

At this time we are using Skinner Hall to its fullest capacity and are now having to move to other accommodations. This situation of expanding will continue and our needs for additional space will be greater each year. An addition to Skinner Hall, or a new unit large enough to accommodate our present needs and future growth is urgently needed.

Need for New Personnel and Sufficient Rank and Salary to Attract Same

This year there has been a concerted effort to find new faculty for the Nutrition and Food Department, and the Textiles, Clothing and Environmental Arts Department. In both areas the market is so limited that there is practically no one qualified for our positions. In Nutrition and Food we previously offered a position to Dr. Franklin Young but did not offer him enough salary to attract him. He went elsewhere. We also very badly wanted to offer Dr. Mary Quam a position but could not get approval for this. We have therefore lost two well qualified people who could have made a significant contribution to the Nutrition and Food Department. This has been very discouraging because qualified people in this field are so scarce and every Home Economics Dean and Head of Nutrition and Food in the country are looking for such personnel.

In Textiles, Clothing and Environmental Arts for the last two years a thorough search has been made to find a Head for the department. Three people were found that measured up to our standards but the institutions in each instance prevailed upon these people to stay in their present positions. The search is continuing but it is difficult because a Head, besides having leadership qualities for this subject matter area, must be eligible for graduate faculty status and must be qualified to do research and direct graduate work. The market situation in this field for a person with these qualities is so slim that there is practially no one to consider. However, this remains our top priority need.

In Human Development, the position was held open pending the selection of a new Head for the department.

The Departments of Management and Family Economics and Home Economics Education also are in need of new faculty so that they can meet the enrollment needs for courses that are required in their areas. They also need faculty to expand the breadth and depth of their graduate work and develop research activities for graduate students.

Critical Need for Additional Clerical Assistance

The situation of support staff for the departments is extremely critical. We do not have sufficient clerical help to write up proposals for research grants, to prepare materials for course work, to help in the development of the departments, and to carry on the operational and administrative activities of the departments and School. All the secretaries in the School of Home Economics have been realigned as to their work assignments for greater efficiency but this has not relieved the shortage of help. We must have additional positions for secretaries to help us carry on our work. We are not able to function effectively under the present setup.

* * * *

NUTRITION AND FOOD DEPARTMENT

Annual Report (5-8) for July 1, 1966-June 30, 1967.

Submitted by: Dr. Elwood F. Reber, Head.

1. Undergraduate Instruction

The Department of Nutrition and Food on October 1, 1966 had 52 majors enrolled. In addition to the courses offered for the Department majors, the Department was also responsible for a nutrition course for nursing students, a nutrition course for Stockbridge students, a foods course for Stockbridge students and a foods course for the 4-year Restaurant-Hotel Management majors. In one of our non-major courses this year there were 107 registrations which made it necessary to have seven sections.

2. Graduate Instruction

A program in Nutrition and Food leading to the Master of Science and Doctor of Philosophy degree was initiated in September of 1966. Department subject matter is concerned with man's use of food and its relationship to his total health and well being. The purpose of this subject matter area is to explore the relationships of the principles and theories of the physical and biological sciences to Nutrition and Food. Economic, sociologic and psychological factors are included. The degree program is open to men and women. Admission requires a Home Economics degree with a major in dietetics or food and nutrition, and a background strong in related natural sciences, or a degree in natural sciences with emphasis on chemistry and biological sciences.

Eight members of the University Graduate Faculty have been appointed to direct the program and to carry out the teaching and research connected with it. They are Dr. E. F. Reber, Professor and Head of Nutrition and Food Department; Dr. D. L. Anderson, Associate Professor of Veterinary and Animal Sciences; Dr. Mark H. Bert, Assistant Professor of Nutrition and Food; Mrs. G. M. Cook, Associate Professor of Nutrition and Food; Dr. Heinrich Fenner, Assistant Professor of Veterinary and Animal Sciences; Dr. M. E. Lojkin, Associate Professor of Nutrition and Food; Dr. S. J. Lyford, Assistant Professor of Veterinary and Animal Sciences; and Dr. Elizabeth Rust, Associate Professor of Nutrition and Food.

The number of graduate students in the Department of Nutrition and Food on October 1, 1966, was two. During the year, students enrolled in the program leading to the M.S. degree in Home Economics but eligible and desiring to specialize in Nutrition and Food were transferred into the Department. At the end of the academic year, the head count in Nutrition and Food graduate program was 17. The Graduate School assistantship allocation was $4,500.

3. Departmental Activities

The Department of Nutrition and Food was responsible for presenting a series of four lectures entitled "Nutrition Conversations with the Community". These lectures were held in the evening, 7:30 to 9:30. The Nutrition and Food faculty responsible for these lectures were: Dr. M. H. Bert, Mrs. G. M. Cook, and Harriet J. Wright.

The Nutrition and Food Department was responsible for a two-week course: NF 675, Current Concepts in Diet Therapy, offered in July 1966. Mrs. Cook was in charge of the course.

The Department also participated in a series of radio talks in which various members of the staff prepared scripts for the discussion of such problems as food preparation, problems of overweight, problems of world nutrition and malnutrition.

Dr. M. H. Bert is a member of the University Health Council. He participated in a radio program (WFCR) which had as its title, "The War On Hunger, How It Can Be Won".

Dr. E. F. Reber is a member of the University Senate, member of the Academic Matters Committee, Chairman of the Distinguished Teacher Award Committee, member of the Religious Department Committee.

Mrs. Cook is a member of the University Fellowship Committee and a member of the University Committee on Scholarship, Financial Aid, Placement and Study Abroad - subcommittee for upper classmen.

Miss Davis is a member of the University Library Committee.

Mrs. McCullough is a member of the University Services Committee.

Miss Wright is a member of the University Senate and member of the Committee on Committees.

4. The Department had the following Post-Doctoral Fellow:

Dr. Bhaskar Punekar
Associate Professor of Biochemistry
Head, Biochemistry Department
All-India Institute of Mental Health
Bangalore, India

Theses, Special Problems and Honors Projects

Skinner, Charlotte
Prevention of Thiaminase Effects in Chicks Fed Raw Clams. Special Problem.

Hankinson, Clarinda
The Effect of Three Additives on Palatability and Selected Characteristics of Stored Radiated Ground Beef. Thesis.

Hoffman, Hannah
The Effect of Methyl Cellulose on Palatability and Caloric Density of Mashed Potatoes. Special Problem.

Kaiman, Deborah
The Effect of Length of Cooking Time on Fluid Content of Fresh and Radiated Haddock. Senior Honors Project.

5. FACULTY PARTICIPATION IN INTERNATIONAL AND NATIONAL PROFESSIONAL AND SCIENTIFIC CONFERENCES AND SEMINARS:

Dr. Elwood F. Reber attended:

Western Hemisphere Conference on the Importance and Safety of Foods. University of Puerto Rico. Sponsored by the Biology Department, University of Puerto Rico and United States Public Health Service, Division of Environmental Engineering and Food Protection. Mayaquez, Puerto Rico.

The Dietary Consultation Workshop, Concord, N.H. Sponsored by the New Hampshire Chapter of the American Dietetic Association and financed by the New Hampshire Division of Public Health.

The 51st Annual Meeting of the Federation of American Societies for Experimental Biology. Chicago. Was co-author of two papers presented to the American Institute of Nutrition.

The 42nd Annual New England Hotel-Motel and Restaurant Show. Prudential Center, Boston.

The Meeting of the Northeast Region Home Economics Administors in Land-Grant Colleges and Universities.

National Meeting of the American Dietetic Association, Boston.

17th Annual Animal Care Panel, Chicago.

The 6th Annual Joint-American Institute of Biological Science Committee - U. S. Atomic Energy Commission Contractors Meeting, Washington, D. C.

7th International Congress of Nutrition, Hamburg, Germany.

The Seminar in Nutrition Science and presented a two-hour talk on Fat-Soluble Vitamins. This seminar was held by the College of Home Economics, Syracuse University, Syracuse, N.Y. The talk presented that morning was part of a ten-day seminar.

Miss Dorothy Davis attended:

Western Mass. Home Economics Association, Lenox, Mass.

American Dietetic Association 49th Annual Meeting, Boston.

Food Forum, New York City.

Annual Food Management Seminar (14th). U. of Massachusetts.

Dr. Mary Lojkin attended:

The 7th International Congress of Nutrition. Hamburg, Germany.

The 51st Meeting of the Federation of American Societies for Experimental Biology, Chicago.

Dr. Mark H. Bert attended:

The 13th Annual Food Management Seminar on the University of Massachusetts campus.

The 31st Annual Meeting of the Federation of American Societies for Experimental Biology, Chicago. Author of one paper presented to the American Institute of Nutrition.

The International Conference on Malnutrition, Learning and Behavior. This conference was held at the Massachusetts Institute of Technology. Boston.

Dr. Elizabeth Rust attended:

Food Management Seminar, U. of Massachusetts.

Northeast Section Meeting of the Institute of Food Technology. (Amherst, Boston, Cambridge).

Food Service Executive Western Mass. Meetings. (Amherst, two meetings held at Worcester, Hadley, Williamsburg). Served as Committee Member of Education Committee. Food Service Executive Association.

American Dietetic Association National Meeting. Boston.

Massachusetts Dietetic Meetings. Boston; Cambridge.

The Seminar for the Management of Extended Care Facilities. Sponsored by the U. S. Department of Public Health and the University of Massachusetts Public Health Department. Participated as a speaker and a panel member. Held on the Amherst campus.

Mrs. McCullough attended:

The Dietary Consultation Workshop, Concord, N.H. Sponsored by the New Hampshire Chapter of the American Dietetic Association and financed by the New Hampshire Division of Public Health.

American Dietetic Association National Convention. Boston.

Attended and on program for "A Training Program for Graduate Dietitians and Nutritionists" sponsored by U. S. Public Health Service, Framingham. Dec. 1966. Presented talk titled "Food Purchasing".

On program for "Food Service in Nursing Homes" sponsored by the Age Center of Worcester area, April 1966. Presented talk titled: "Food Purchasing".

Has served as President of the Western Massachusetts Branch of the Food Service Executive Association. Attended and presided at monthly meeting of Western Mass. Food Service Executives throughout western part of state.

14th Annual Food Service Seminar, University of Massachusetts, January 1966. Is a member of the Mass. Educational Food Service Council and has been on program planning committee of the 1967 Food Service Seminar, and is co-chairman of the 1968 Food Service Seminar.

Eastern Territory Food Service Seminar and Conference, and gave report. April 1966.

Mrs. Cook attended:

American Dietetic Association National Annual Meeting. Boston.

Northeast Regional Conference on Nutrition Education. New Haven, Conn.

Two meetings of Western Mass. Dietetic Association.

One meeting of Western Mass. Home Economics Association.

Miss Harriet Wright attended:

American Dietetic Association. Boston. Served as a state delegate.

International Conference on Malnutrition, Learning and Behavior. Mass. Institute of Technology, Cambridge.

National Nutrition Specialist Workshop. Dallas, Texas. Participated in program.

National Nutrition Education Conference. Washington, D.C.

Northeast States Nutrition Education Conference. New Haven, Conn. Served as Resource Consultant.

Massachusetts Dietetic Association evening meetings.

6. List of Publications

Bert, M.H., C. Skinner and E.F.Reber - Prevention of thiaminase effects resulting from ingestion of raw clams. Fed. Proc. 26, 526, 1967.

Raheja, K. and E.F. Reber - The effects of testosterone proprionate and dicumarol on prothrombin time in capons. Fed. Proc. 26, 698, 1967.

Reber, E.F., M.H. Bert, J. Simon and K. Raheja - The wholesomeness evaluation of radiation sub-sterilized food products. 6th Annual AEC Food Irradiation Contractors Meeting, page 97; October 1966.

Reber, E.F. - The wholesomeness evaluation of radiation sub-sterilized food products; Review of the Food Irradiation Program, Hearing before the Sub-Committee on Research Development and Radiation of the Joint-Committee on Atomic Energy. Congress of the United States. 89th Congress, page 196, 1966.

Reber, E.F., K. Raheja and D. Davis - Wholesomeness of Irradiated Foods. An Annotated Bibliography. Fed. Proc. 25: 1529-1579, 1966.

Lojkin, M.E. - Effects of Levels of Nitrogen Intake on Tryptophan Metabolism and Requirement for Pregnancy of the Rat. J. Nutr. 91: 89, 1967.

7. Research Grants and Projects

Compilation of an annotated bibliography on the wholesomeness of irradiation preserved foods. Investigators: E.F. Reber, K. Raheja, and D. Davis. Supported by the Office of the Surgeon General.

Evaluation of the wholesomeness of irradiation pasteurized clams. Investigators: E. F. Reber, K. Raheja and M. H. Bert. Supported by the Atomic Energy Commission.

Tryptophan metabolism and requirement for pregnancy. Investigator: E. F. Reber. Supported by Faculty Research Grant.

Enhancement of the nutritive value of unicellular algae. Investigator: M. H. Bert. Supported by Faculty Research Grant.

The influence of radiation, storage time, and method of preparation on the palatability of selected marine products. Investigators: E. F. Reber and E. Rust. Supported by the Bureau of Commercial Fisheries, United States Department of the Interior.

Grant for improvement of dietetics and institutional administration curriculum. Supported by the Department of Health, Education and Welfare, Public Health Service, Bureau of Health Manpower. Director: E. F. Reber.

8. PLANS AND NEEDS

The present laboratories were installed and furnished in 1948. In the intervening 20 years, great changes have been made in the equipment used in food production, meal planning and management. This new equipment should be made available to improve the quality of instruction.

Many of the storage cabinets installed in 1948 were not even new but were transferred from the previous quarters. The storage facilities at the present time are not only inadequate to meet the enrollment needs but some of it has reached a point of being nonfunctional.

The facilities now available for meal service, an important facet of the teaching program, are at the present substandard. Most of the tables and chairs in use today were not designed to be used for meal service. Although the furnishings in the dining-room are of a type found in homes, they do not meet the requirements for functional and economical space utilization in a laboratory situation.

The plan for renovation submitted is designed primarily to enable the department to do a better teaching job. At the present the department is attempting to teach for this generation's living conditions, using the previous generation's worn out equipment.

Present facilities are inadequate and in need of updating. Lack of equipment and space makes teaching difficult and instructor's ideas cannot efficiently and adequately be carried into the laboratory situation. Furniture as well as equipment needs updating if teaching is to be most effective.

Expanding programs with consequent growing numbers of students make it necessary to have more facilities to carry out ideas for improvement in curricula and courses. This refers to both undergraduate and graduate work. There has been an increase in the number of major and non-major students and an increase in the number of students from Restaurant and Hotel Management program.

The addition of two unit kitchens in laboratory 220 will increase the number of students from 16 to 24 that can be put in a laboratory section. This would afford better utilization of staff since one instructor will be able to teach a laboratory with 24 students instead of 16.

Renovation of the storeroom would decrease food and labor cost in the laboratory by more efficient and better purchasing practices. Renovation of the storage room is urgent as present facilities have outgrown the needs of the department. Efficient management of supplies and food for laboratory work is hampered with present facilities. An expansion of the present storage room by converting the "old" dressing room and present storage room into one large room is necessary for next fall. With this is needed expanded refrigerator, freezer storage, cabinets, etc., facilities. The renovation would enable us to improve and augment the teaching of food service standards by separating preparation and service areas.

A lab technician is needed to increase the productivity of the professional staff since many routine laboratory tasks and analyses can be delegated to the technician. These tasks can include the cleaning of equipment, such as glassware, preparation of diets, routine weighing and measuring, and certain analytical determinations depending upon the nature of the determinations and the qualifications of the technician.

There is a need to increase the Graduate School assistantship allocation and some funds should be made available to support honors research projects, graduate student special problems and thesis research.

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HOME ECONOMICS EDUCATION DEPARTMENT

Annual Report (5-9) for July 1, 1966-June 30, 1967

Submitted by: Helen R. Vaznaian, Head

PROFESSIONAL ACTIVITIES

1. Annual Conference, Association for Supervision and Curriculum Development, NEA, March 1967; Dallas, Texas.

2. Educational Policies Commission, New England Association for Supervision and Curriculum Development, NEA, ASCD.

3. College Chapter Advisor: Massachusetts Home Economics Association, American Home Economics Association, Washington, D.C.

4. Consultant: Development of Occupational Education Programs Related to Home Economics, Newton Public Schools, Newton, Mass.

5. Consultant: Harvard University, Cambridge, Mass. and AID.

   a. Senator Odessa Gittens, Parliamentary Secretary, Ministry of Health and Education, Barbados.

   b. Continuation...First Comprehensive High School, Lagos, Nigeria.

6. Consultant services to:

   a. North Easton Public Schools.
      Mrs. Tufts: Planning facilities and developing new program in Home Economics.

   b. Bement Junior High School, Deerfield.
      Mrs. Sutter: Developing curricula.

   c. Hampden Junior High School.
      Mrs. Sitnik: Planning new facilities and curricula

   d. Groton Senior High School.
      Mrs. Bowker: Planning new facilities and curricula.

   e. Northampton High School.
      Mrs. O'Master: Revising curricula.

MAJOR ACCOMPLISHMENTS

1. Revision of the Proposed Major in Secondary Education and Extension.

   a. The requirements in general education have been increased and provision has been made for students to acquire greater depth in the root disciplines of Home Economics, namely, sociology, psychology, economics, and chemistry.

   b. The students have the opportunity to affiliate with the Merrill-Palmer Institute, Detroit, Mich., or the University of New Mexico for a semester of study.

   c. The students have the opportunity to pursue a special sequence such as Journalism along with the regular undergraduate program in Home Economics Education. Girls with this particular combination are greatly in demand by book, magazine, and newspaper publishers as well as by consumer education departments of large concerns.

   The undergraduate program is subject to continual evaluation. Revisions will be made as necessary in order to remain responsive to the times, present and future.

2. Plan and design Replacement Facility for Home Economics Education, Appendix A. The loss of the Homestead necessitates our requesting replacement of suitable functional facilities for our program.

3. Implementation of a pilot program for full time graduate study in Home Economics Education. This aspect of our development will receive increasing critical attention next year. Nevertheless, we are pleased with the calibre of scholarly work done by our students this year:

   a. May Huang, recipient of a University Fellowship, accepted for the doctoral program at the University of Illinois.

   b. Charlotte Skinner co-authored with Dr. Bert and had article accepted for publication.

   c. Charlotte Colton upon completion of her program will teach at Salve Regina College, R. I.

   d. Joan Bolton upon completion of her program will teach at Holbrook High School, Long Island, N. Y.

Several students will complete their Master's Degree requirements in June, 1968.

4. Provision of leadership for upgrading the professional preparation of Home Economics Educators at the secondary school level through University Extension.

   a. Twenty-nine teachers from Pittsfield and surrounding communities completed the course, H. E. Education 682, Curriculum and Methods in Home Economics Education, earning 3 credits. The course was taught by Mrs. Marjorie F. Sullivan at Pittsfield High School, Spring 1967.

   b. In response to a request from Dr. Lawrence Anderson, Assistant Superintendent of Schools, and Miss Florence Forsythe, Supervisor of Home Economics, Arlington Public Schools, we will offer H. E. Education 682 in Arlington, Fall 1967.

   c. This summer we are offering H. E. Education 710, Seminar in Home Economics Education, from July 10 - 28, on the Boston campus. Thus far, 22 have indicated interest.

   d. In cooperation with Mr. Walter Markham and Mrs. Agnes O'Neill of the State Department of Education, we will offer a one week Institute: New Directions, Curriculum, and Methods in Technical-Vocational Education. The Institute will be held at Westfield State College and all teachers in the Vocational Schools in Massachusetts will participate. (June 27+).

FUTURE PLANS AND NEEDS

1. Our immediate urgent need is for replacement facilities in order to meet the diverse preparation requirements of those in Home Economics Education. Attached is the justification for and the plans of proposed minimal facilities. A totally colored-key plan has been given to Mr. Littlefield. Please feel free to call upon me for further explanation or assistance.

2. Our need for a full time secretary is great. Presently, we participate in the office pool. Since many use this service, requests often must be delayed or forgotten. Last fall, for example, students had to pay $4.00 to have the units of work they prepared mimeographed by an outside source in order that the materials would be ready in time for student teaching.

   A growing undergraduate program, a growing graduate program, a growing extension program all necessitate the duplication of suitable teaching materials in addition to the myriad of details normally taken care of by a secretary. Too much of the present

staff's time is spent performing secretarial tasks. Regretably this is both costly and inefficient administration. Consideration of this request will be greatly appreciated.

3. Lastly, we need the addition of a full time member of the professional staff who will be able to devote her abilities to the development of the graduate program in occupational education related to Home Economics. The significance of this development can be seen in the fact that 226 million dollars was appropriated by the federal government this year for the expansion of occupation related programs of Home Economics at the secondary school level.

Re: FUTURE PLANS

1. We need to conduct a follow-up study of our recent graduates for the purposes of receiving (1) a critical appraisal of our program, undergraduate and graduate; (2) examining the variety of professional positions held; (3) determining future directions.

2. We need to become actively engaged in research activities. It is imperative that time be made available in the program for research development. With the addition of professional staff to share teaching responsibilities, this could become possible.

3. We intend to develop a viable program in Home Economics Education at the graduate level. We expect to work with increasing effectiveness with the departments within the School of Home Economics, the School of Education, and the College of Liberal Arts.

4. We expect to expand our present program of university extension in an effort to upgrade the professional preparation of teachers. We will continue to actively participate in state and national professional associations.

5. We expect to sponsor an intensive, high powered Institute in Family Life Education during the summer, 1968. This is in response to local, state, and national needs. (The Federal government is currently subsidizing programs in Family Life Education at the secondary school level).

6. We may also sponsor an Institute in Occupational Related Programs in Home Economics, summer, 1968, if a preliminary survey establishes the need. State College at Framingham is offering one this year.

N.B. Helen Vaznaian, Department Head, was on a leave of absence from Sept. 1, 1966 - Feb. 1, 1967. During second semester she was on a 2/3 leave completing research for her dissertation. Mrs. Marjorie Sullivan was assigned, Spring Term, 1/2 time in the Department of Textiles, Clothing and Environmental Arts and 1/2 time in Home Economics Education. Nevertheless, several significant developments have occurred.

MANAGEMENT AND FAMILY ECONOMICS DEPARTMENT

Annual Report (5-8) for July 1, 1966-June 30, 1967.

Submitted by: Verda M. Dale, Head

I. FACULTY PUBLICATIONS, RESEARCH GRANTS, RESEARCH PROJECTS AND OTHER PROFESSIONAL ACTIVITIES.

Research Grant: A grant of $24,000 for investigation of education in Market Structure and Price Policies as related to the social and economic environment of families lacking economic freedom was awarded February 1, 1967, to the Extension Division of Home Economics. While the research grant was awarded to the Extension Division, the investigation will be primarily by members of the Management and Family Economics Department staff. Work will begin September 1, 1967.

Professional activities: Three members of the Department -- Edward K. Knapp, Marjorie M. Merchant, and Verda M. Dale -- are doing graduate work leading to doctoral degrees.

One staff member (Barbara Higgins) served as a consultant to the Social Security Administration in developing programmed materials to be used in teaching Social Security information to lay audiences. She also served as a resource person in three separate training sessions for Credit Union Managers.

Another staff member (Marjorie M. Merchant) has been active in State Consumer Education programs. She has been a speaker at two State meetings, Massachusetts and Maine, served as a member of a teaching team at Boston University teaching a graduate course in Consumer Education, and has been one of the faculty of the Division of Continuing Studies at Framingham State College, teaching a graduate course in Consumer Economics.

II. MAJOR ACCOMPLISHMENTS OF UNIT.

The most important occurance of the year was the formal acceptance of the Management and Family Economics subject matter area as a department. The creation of a department has assisted in the development of a more professional attitude and responsibility toward the subject matter, and has been of help in welding unity in campus and off-campus activities.

Major activities in which members of the department have taken responsibility in developing and carrying out include non-credit seminars, three in number, held at the University of Massachusetts/ Boston, in the areas of Management, Family Economics and Consumer

Education. These seminars, ranging from three to eight sessions, were directed toward professional and semi-professional workers working with less advantaged families in community action programs.

Members of the department have participated in 16 television shows on WHDH-TV, Boston, and in 18 radio programs on Conversation, WFCR-FM, Amherst.

One staff member (Marjorie Merchant) was chairman, and another (Edward Knapp) served on the committee which planned and carried out a Consumer Conference held at the University of Massachusetts in Amherst on May 4, 1967. The program was directed to issues in the areas of clothing, credit, medical and health services and housing. The attendance was over 200.

All members of the department have contributed to teaching plans of the home economists working in low-income programs in the South End and Washington Park, Boston, and in Lynn and Malden. The low-income programs have been oriented toward the teaching of Management and Family Economics.

III. SPECIAL PROJECTS OR PROGRAMS

Two special programs, one completed and the other on-going, are noted.

One staff member (Verda Dale) is working with the Massachusetts Commission of the Blind in developing a team approach between the Vocational Rehabilitation Division of the Commission and Extension Home Economists to the rehabilitation of the newly blinded homemakers. Agents from four counties are now serving as resource persons for Home Economics for the teachers of the blind, and have served as teachers for referred cases. Continuous training is being carried out to acquaint the Extension Home Economists of special techniques necessary when visual impact is absent or impaired.

A special housing program was conducted by a staff member (Edward Knapp) last fall to assist employees of the Morart Manufacturing Company make satisfying housing choices that were necessary because of the move of the company from Holyoke to Lee, Mass. Mr. Knapp worked with officers of the company, employees and community resource groups in the new community to help the families think through the housing decisions and to make the moving of the company a less traumatic experience for the employees.

IV. PLANS FOR THE DEPARTMENT

Plans for the department can be stated in three objectives:

a. Improve and strengthen undergraduate teaching. Develop an undergraduate major in the area of Home Management and Family Economics.

b. Develop a graduate program leading to the Master's Degree. Research will develop with the graduate program.

c. Maintain a dynamic off-campus program geared to meeting the educational needs of the families of the Commonwealth in the areas of Home Management, Family Economics, Consumer Education and Housing.

To carry out these plans, personnel and facilities are needed.

The most immediate need of the department is the development of a satisfactory Home Management-Household Equipment laboratory to take the place of the Homestead. Space has been promised in Hampshire House, and it is imperative that the new laboratory be developed as soon as possible to provide for the classes that are built about laboratory participation. The laboratory will also provide some space for faculty and graduate research.

The same urgency is present in the need to strengthen and build the undergraduate offerings and to develop a graduate program. The demand for graduates, at both the bachelor's and master's level, far exceeds the supply.

Additional personnel are essential within the next two years if these needs are to be met on even a minimal basis. Staff who have been primarily concerned with Extension activities are being used for teaching courses, but it is impractical to make further assignments for resident teaching from this source. New staff should have major responsibilities in teaching and research. Staff eligible for graduate faculty are particularly necessary.

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HUMAN DEVELOPMENT DEPARTMENT

Annual Report (5-8) for July 1, 1966-June 30, 1967

Submitted by: Dr. A. Raymond Cellura, Head.

Departmental goals for the 1966-67 academic year included: 1) departmentalization; 2) curriculum development; 3) expansion of graduate program; 4) appointment of new personnel; 5) development of a doctoral program.

The following report will focus on progress in the above and related departmental developments.

Departmentalization

For over six years the various departments of the School of Home Economics had been working toward formal departmentalization. In the late fall of 1966, a formal request was presented to the University trustees and on December 13, 1966, the trustees voted to confer departmental status upon all of the departments in the School of Home Economics, including the Department of Human Development.

Curriculum Development

In past years, curriculum development had not kept pace with the rapidly increasing undergraduate enrollment and the more intensive training necessitated by the increasing professional responsibilities of Early Childhood Education majors. It was also clear that the curriculum followed by the Child Development major was too diffuse, attempting to satisfy the requirements for training in three professional and scientific areas, rather than in one. To improve this situation, it was decided to:

a) add new courses in Human Development
b) revise the Early Childhood Education curriculum
c) develop curricula for two new major areas of concentration

In the fall of 1966, three new courses were submitted to and approved by University officials. These were:

HD 310 Language and Cognitive Development
HD 350 Observational Child Study
HD 360 Theories of Human Development

In addition to these new courses, all seniors were required to take a one-year seminar in Human Development. This seminar met for one hour each week, over both fall and spring semesters. Its purpose was to provide seniors with an opportunity to meet with departmental faculty as a group and discuss issues and questions related to developmental phenomena. The overarching purpose of the seminar was to provide the students with an opportunity to integrate concepts and facts they had been acquiring in their area of concentration over three years of undergraduate study.

Child Development Curriculum

A revised Child Development curriculum was developed and presented to the School of Home Economics Undergraduate Curriculum Committee for its approval. The new curriculum strengthens the concentration of work in Child Development, with special emphasis upon the social and biological sciences. Course work in these areas is substituted for course work in areas that were germain to students majoring in other departments of the School of Home Economics.

Graduate Program

In the past, there has been virtually no graduate program in Human Development. In 1965-66, a student matriculated for the master's degree for the first time in many years. In 1966-67, there were two students matriculating full time for masters' degrees in Human Development. Although it was felt to be premature to publicize too widely a departmental program in Child or Human Development, nevertheless, there were eight applicants for graduate admission. Three of these were accepted and awarded assistantships for the 1967-68 academic year. All of them compare very favorably with graduate admissions in other departments of the University. For instance, two of them have Miller Analogies scores of 92 and 87.

Faculty and Staff Appointments

Recruitment has been one of the most disappointing areas of departmental activity this past year. Two positions were open to be filled, one for a faculty member and the other for a staff assistant. Four interviews were conducted to fill the faculty position and about a dozen to fill the staff assistant position. Both positions would very probably have been filled by now. However, the resignation of the incumbent department head led to a "freeze" on departmental appointments until a new department head can be appointed.

Ph.D. Program

The new departmental courses accepted for graduate and undergraduate credit this year and the new group of graduate students strengthen the departmental capability for a Ph.D. program. Much still needs to be done. There will need to be an increase in faculty and the development of a curriculum at the graduate level through the Ph.D. In this connection, it is recommended that a group of extra University consultants be brought in to advise on the development of a four year graduate program.

Faculty Publications

The following articles have been published by faculty members within the past year:

Cellura, A. Raymond. Intelligence, the Bender-Gestalt Test and Reading Achievement. American Journal of Mental Deficiency, Volume 71; No. 1, July, 1966.

Olim, Ellis G. Children's Ways of Thinking. The P.T.A. Magazine, January, 1967.

Professional and Scientific Conferences

Dr. A. Raymond Cellura - Florida Educational Research Association meeting, Daytona Beach; presented paper. Jan. 1967.

American Educational Research Association meeting, New York City; Feb. 1967.

Society for Research in Child Development meeting, New York City, Mar. 28-Apr. 2, 1967.

Dr. Margaret Fernandes - Annual convention of The National Association for the Education of Young Children. Chicago. Nov. 1966.

Dr. Ellis G. Olim - Society for Research in Child Development meeting, New York City; Mar. 29-Apr. 1, 1967.

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TEXTILES, CLOTHING & ENVIRONMENTAL ARTS DEPARTMENT.

Annual Report (5-8) for July 1, 1966 - June 30, 1967.

Submitted by: Marion A. Niederpruem, Acting Head.

MAJOR CONTRIBUTIONS

The Textiles, Clothing and Environmental Arts Department is engaged primarily in undergraduate teaching and extension activities. The latter are described in the Home Economics Division Annual Report found in this document.

This past year there were three new faculty members (two replacements and one new position) whose major responsibility was teaching:

Herbert S. Paston - Environmental Arts
Catharine C. Crow - Fashion Merchandising
Rachel Hanson - Clothing and Textiles

These faculty members have made a significant contribution to the department in that they provided competency in their subject matter fields as well as effective teaching methods. Virginia Davis and Rosa Johnston from the extension division each taught a course. Thus all members of the department were engaged in teaching.

The number of courses offered increased from the previous year from 16 to 20. The enrollment in courses increased from 504 to 829. We had to turn away 200 students who wished to take courses in this department because we had neither faculty nor laboratory space to accommodate them.

Herbert Paston has been reorganizing courses in Interior Design and developing a sequence of existing courses, available on campus, for the purpose of allowing students to obtain some specialization in this subject matter area. This will provide some professional training for those who wish to enter this field of business. He has also developed a gallery area on the ground floor of Skinner Hall where exhibits and collections from museums, and student and departmental work can be displayed effectively.

All the faculty produced half-hour radio programs on Station WFCR-FM. These were content programs geared to the subject matter area. These programs were rated very highly by the station and the listening audience.

Two of the most important field trips that the department took this past year were the Art and the Fashion Merchandising trips to New York City. These trips covered a two-day span and included museums, manufacturing center, buying offices, magazine offices, retailing establishments, design centers - all geared to the subject matter in both areas of the department.

PROFESSIONAL ACTIVITIES

The faculty participated in the following meetings and programs:

Catharine Crow - National Retail Merchants Association, New York City, January 1967.

Distributive Education Conference, New Haven, Conn., March 1967.

Virginia Davis - Eastern Region College Clothing and Textiles Teachers, New York City, Oct. 20-21, 1966.

"Urbanization, the Individual and the Family" Meeting at the Boston University Center for Study of Liberal Education, December 1966, and June 1967.

Fashion Group meeting, New York City, February 1967.

Rachel Hanson - Textile Seminar, University of Connecticut, November 1966.

Sarah L. Hawes - Eastern Region College Teachers of Textiles & Clothing, New York City, Oct. 1966.

Textile Seminars, University of Connecticut, October and November 1966, and February 1967.

Western Mass. Home Economics Meeting, Lenox, Mass., Fall 1966.

Rosa Johnston - Extension Home Economics Conference Task Force Study Group with staff from Boston University Center for Study of Liberal Education. Assignment: Individual and Society. Dr. Peter Siegle, Tutor, June 1966, June 1967.

Summer Seminar on New England History & Decorative Arts sponsored by Connecticut Valley Historical Societies, July 18-22, 1966.

Massachusetts Art Education Association meeting, Lexington, Oct. 1966.

National Home Furnishing Specialists Conference, Dallas, Texas, May 7-12, 1967.

Herbert S. Paston - Worked on Ph.D.

Writer-Director of film COLLAGE - one of a series exploring art media, produced by ACI Productions, New York City, 1965-66.

Educational Consultant, Davis Denalevey, Inc., (Publishers), New York City, 1966-67.

In progress: ADVENTURES IN ART, a series of 16 volumes on art appreciation being developed for "My Daily Reader" by Davis Denalevey, Inc. (Publishers).

FUTURE PLANS AND NEEDS

For the last two years, a thorough search has been made to find a Head for the department. Three people were found that measured up to our standards but the institutions in each instance prevailed upon these people to stay in their present positions. The search is continuing but it is difficult because a Head, besides having leadership qualities for this subject matter area, must be eligible for graduate faculty status and must be qualified to do research and direct graduate work. The market situation in this field for a person with these qualities is so slim that there is practically no one to consider. However, this remains our top priority need.

A graduate program in this area is a very great need. We have many requests from people who wish to do graduate work in this field toward a master's degree. Research activities must be initiated in order to support graduate studies. Faculty and students must be engaged in research. We do have undergraduates doing independent studies but this is a normal part of the undergraduate program and the type of research needs to be at a sophisticated level for graduate status. Additional faculty will be needed to support a graduate program.

The faculty are continually working to improve course content and methods of teaching. Innovations in teaching are being developed to make course work more effective.

Additional faculty and facilities (new laboratories) will be needed in order to take care of the growth in the school. We must increase the number of courses and sections offered in order to accommodate the increase in the number of students. In this department we turned away over 200 students this past year that we could not get into courses because of lack of faculty and laboratory space. This growth will continue and the situation will be a serious one as we try to take care of our students.

We are working with the School of Education on developing a Distributive Education program which will include preparation for teaching of Distribute Education in high schools under federal funds. This program will lead to certification for teaching. We have many requests from students who want such a program.

The department has short and long range programs for development to meet the needs of the students. These plans have previously been submitted to the Provost.

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DIVISION OF HOME ECONOMICS EXTENSION

Annual Report (5-8) for July 1, 1966-June 30, 1967.

Submitted by: Winifred I. Eastwood, Head

Introduction

Home Economics Extension is an adult education program on subjects and problems related primarily to family, home and community life. The program of the Division of Home Economics Extension, University of Massachusetts, can be classified into two areas of emphasis:

CONTINUING EDUCATION opportunities organized by the Division for citizens to increase their knowledge, skills, appreciation and sensitivity. The opportunities are programmed through seminars, workshops, conferences, meetings and programs over both television and radio. During a year, there are twenty-five to thirty different subjects offered to the general public or a specific special interest audience (professional and/or lay) with an attendance which will vary from 20 to over 100. Ninety percent of the programmed opportunities are a series from three to ten sessions. The television effort is a weekly program over WHDH-TV, Boston, which is produced by state and county Extension Home Economists. The radio programs are by the state Extension faculty on the Four College Radio, WFCR.

PROBLEM CENTERED PROJECTS for which lay groups advise as to the areas of concern and assist staff in working out ways in which the problem or facets of the problem may be affected by educational methods. A total of 375 citizens of the Commonwealth are members of these advisory groups.

The greatest difference between the two areas, Continuing Education and Problem Centered Projects, is in method and clientele. The subjest matter, with adaptations, is much the same. In the Problem Centered Projects the faculty develop teaching materials which lay leaders are trained to use in small community study groups organized by the County Extension staff. The Division faculty trained 1160 individuals in the past year to function as teaching leaders. The leaders and group participants are primarily middle income homemakers with high school education. The homemakers are organized in small community study groups.

Members of the Advisory Councils are, for the most part, members of the study groups. Beyond doing study, it is expected that participants will give leadership to change, not just be satisfied with the collection of information, facts and new knowledge.

Special Clientele

THE LOW-INCOME FAMILY has received special attention by the Division since 1962. The Division has made a special effort to program for the low-income family by developing teaching materials, training county staff and other professionals and by doing some direct teaching, thus to learn first hand the problems of the families.

A study was made in 1963 with a follow-up in 1964 in South End, Boston. The study was to determine if Extension methods could affect change with low-income families. The study gave the Division of Home Economics state and county staff backing to go ahead and develop projects with the families of our center cities. During the past year, projects with the clientele have been in progress in Greenfield, Pittsfield, Springfield, Worcester, Lawrence, Lynn, Malden, Boston (South End and Washington Park), New Bedford, and Taunton.

BLINDED HOMEMAKER groups have been meeting monthly in Middlesex, Plymouth, and Worcester Counties. The homemakers have declared the effort has been helpful, they have learned new methods, have been made aware of new products, and have had an opportunity to exchange ideas. The Massachusetts Association for the Blind has assisted the County Extension Home Economists in organizing the homemakers for instruction.

Home Economists are now cooperating with the Massachusetts Commission for the Blind as a part of the rehabilitation team for newly blinded homemakers, they serve as resource persons for the Home Teachers of the Blind and are used as referrals for direct teaching of newly blinded homemakers.

PROBLEMS OF FAMILIES on which the total program of the Division for all audiences is focused:

Management of money and other family resources
Human development and family relationships
Art and design, home decoration and furnishings
Food, nutrition and health
Housing for the family
Consumer education
Leadership development for community needs

Examples of Extension Programs Carried by the Extension Division Faculty

MANAGEMENT

Management is a dynamic process of developing competences to:

Establish values which give meaning to personal, family and community living; select goals appropriate to these values.

Create a home and community environment conducive to the healthy growth and development of all members of the family at all stages of the family cycle.

Make and carry out intelligent decisions regarding the use of personal, family, and community resources.

Establish long-range goals for financial security and work toward their achievement.

Plan consumption of goods and services - including food, clothing, and housing - in ways that will promote values and goals established by the family.

Purchase consumer goods and services appropriate to an overall consumption plan and wise use of economic resources.

Perform the tasks of maintaining a home in such a way that they will contribute effectively to furthering individual and family goals.

The programs listed below are directed toward developing these competences.

HOME MANAGEMENT - a seminar focused on family values and management, family decision making, food selection and buying, food and health, and family finances.

Participants - Teachers and Leaders of Today's Urban Disadvantaged Family.

Dates	Place
Oct. 11, 14, 25, Nov. 18, 15, 22, 29, 1966	U. of Massachusetts/Boston
Mar. 7, 14, 21, 28, 1967	U. of Massachusetts/Boston

Attendance - 25, October

18, March

Faculty - Verda M. Dale, Professor, Extension. Management and Family Economics.

Harriet J. Wright, Associate Professor, Extension. Nutrition and Food.

Barbara Higgins, Professor, Extension. Management and Family Economics.

Guest Lecturers - Mrs. Ione Vargus, Supervisor, Home Development Services, Roxbury Multi-Service Center.

MANAGING FOR FAMILY SATISFACTION - a series of work meetings where indivisuals use work sheets and forms as guides to help analyze their present situation regarding use of time, energy, equipment, money, skills and knowledge. Each is encouraged to think through her own family situation and to work out a plan to achieve the family's objectives.

During 1966-1967, the series was held in Barnstable, Dukes, Bristol, Norfolk, Middlesex, Franklin, Hampshire and Plymouth Counties. State and/or county staff (county staff are trained by the state specialist) conduct the series for 15-20 homemakers in each group.

Participants - Lay

Dates	Place
Fall 1966	Norfolk County
Fall 1966	Bristol County
Spring 1967	Middlesex County

Attendance - 15-20 each series.

Faculty - Barbara Higgins, Professor, Extension. Management and Family Economics.
County Home Economists.

HUMAN DEVELOPMENT & FAMILY RELATIONSHIPS

The Home Economics Extension program in Human Development and Family Relationships is based primarily on the academic disciplines of developmental psychology and family sociology. Projects are intended to provide adults with opportunities to study and discuss ways in which family life may be enriched through the understanding and application of reliable data concerning human growth and development and principles of healthy, constructive human relationships. The specific goals are:

To help families, parents and youth to understand their own development of the various stages of the life cycle.

To help individuals and families to understand inter-personal relationships within the family (husband-wife, parent-child, sibling, in-law) at the various stages of the family life cycle.

To help leaders of youth in organizations (4-H, church, scouts) to understand ages and stages of youth, and to be aware of teaching and leadership methods applicable to youth.

HUMAN RELATIONS IN THE FAMILY - various projects designed for the study and discussion of the crucial relationships within a family (husband-wife, parent-child, siblings, in-laws) with emphasis upon the effects of interpersonal relationships upon human development.

Participants - homemakers; leaders of community organizations

Dates	Place	Attendance
March 1, 1967	Barnstable County	27
March 8, 1967	Barnstable County	34
March 15, 1967	Barnstable County	36
April 13, 1967	Essex County	35
April 21, 1967	Hampshire County	28
May 11, 1967	Plymouth County	32

Faculty - Joseph D. Burroughs, Professor, Extension. Human Development.

ART & DESIGN

Without question, our taste and creative urges are born and nourished in our homes, and they are the products of the values [illegible] there .... Women are creators of values. Their job is to select raw materials and use them to make life worth living .... Art to many is associated with the accessories and frills of life and people are considered artistic if they paint, carve figures, or create interiors.* Art can mean more to a family than a superficial activity for its members -- it can be the basis for a rich full life.

*(From Speech by Jennie Rowntree "Values in Action", International Design Conference, 1967.)

The objectives of the program are as follows:

To develop an interest in, appreciation of and understanding of the elements of art and design as basic to any decision or choice of furnishings for the home.

To develop a sense of the significance of the relationship of the human and his potential to home furnishing choices.

To develop a sense of competence and security in making design decisions for his home based on exposure to and experience with objects of good design.

To appreciate and appraise aesthetic values of clothing and textiles.

To understand and apply the principles involved in achieving appropriate and becoming dress.

AMERICAN DRESS AND DECORATION - series of study meetings to explore some of the design relationships and parallelisms of architecture, interiors and clothing in periods of colonial 18th, 19th, 20th centuries.

Participants - Lay

Dates	Place
Jan. 5, 12, 19, 26, 1967	Middlesex County
April 6, 13, 20, 27, 1967	Plymouth County

Attendance - 30, Middlesex County

15, Plymouth County

Faculty - Mrs. Rosa S. Johnston, Associate Professor, Extension. Textiles, Clothing and Environmental Arts.

Virginia Davis, Associate Professor, Extension. Textiles, Clothing and Environmental Arts.

WHY WE DRESS AS WE DO - a series of in-depth study meetings, including an introduction to the psychological aspects of clothing; the relation of clothing to social behavior, and the role of clothing in self-expression and self-image.

Participants - Professionals and Lay

Dates	Place
Feb. 2, 9, 16, 23; Mar.2, 9, 1967	Eastern Mass. Teachers Association
April 14, 21, 28; May 5, 1967	Plymouth County

Attendance - 15, Plymouth County

14, Eastern Mass. Teachers Association

Faculty - Virginia Davis, Associate Professor, Extension. Textiles, Clothing and Environmental Arts.

NUTRITION, FOOD AND HEALTH

"The history of nutrition is the history of life on this planet. It has been and is a tool of politics, of war, and of conquest. It has affected exploration, discovery, colonization and the fate of populations. In modern life, it involves agriculture, transporation, industry and trade and with them all the socio-economics, scientific and cultural aspects of our society; all to the aim in the end, of the health and vigor of the individual human being, and the prevention, treatment, and recovery from disease." -- J. B. Youmans, American Journal of Medicine. 25:659, 1958.

The Home Economics Extension Program offers courses in nutrition, food and health which are formed on current problems and concerns. The goals of the program are as follows:

To help individuals and families to understand their nutrition needs throughout the life cycle.

To promote health and pocketbook protection for people by increasing knowledge levels that will enable them to make

safe and effective use of products
wise selections and
discriminatory evaluation of advertising.

To help individuals and families to bridge the gap between what is known and what is practiced in the areas of nutrition, food and health.

To help families be more aware and have a better understanding of the need for developing sound food attitudes and habits in children.

NUTRITION CONVERSATIONS WITH THE COMMUNITY - a series of meetings on current nutrition concepts as they are influenced by the social and economic environment - including criterion for sound nutrition, nutrition in human development, current nutritional status in the U.S.A., changes in American food habits, weight control, and the danger of nutritional fads.

Participants - Professionals and Lay

Dates	Place
Oct. 31, Nov. 7, 14, 21, 1966	U. of Massachusetts/Amherst

Attendance - 60

Faculty - Harriet J. Wright, Associate Professor, Extension. Nutrition and Food.

Dr. Mark H. Bert, Assistant Professor, Nutrition and Food.

Mrs. Gladys Cook, Associate Professor, Nutrition and Food.

VITAMIN SUPPLEMENTS & THEIR CORRECT USE - a program to increase the knowledge level as regards man's need for vitamins which are available in food and pill form. The focus is on the indescriminate use of pills by many Americans.

Participants - Lay Teaching Leaders

Dates	Place
January 11, 1967	Hampden County
Jan. 31, Feb. 1, 7, 1967	Middlesex County
March 14, 1967	Dukes County

Attendance - 12, Hampden County

47, Middlesex County

28, Dukes County

Faculty - Harriet J. Wright, Associate Professor, Extension. Nutri- and Food.

HOUSING FOR THE FAMILY

Approximately one-fourth of our national wealth is in the form of city and village dwelling - making housing important economically. Winston Churchill once said, "We shape our buildings and afterwards our buildings shape us." - suggesting housing as a social influence. When these two aspects are coupled with the idea of primary use by families, residential housing becomes a topic of central concern to the field of Home Economics.

In considering this area for study, many facets appear. The goals of the program are to:

Gain an appreciation of residential "settings" in the United States; i.e., cities, villages, new towns, developments and neighborhoods. The "ideal" concept is frequently helpful in providing a contrast to the existing establishments.

Learn the variability available in the layout and elevations of modern dwellings.

Increase knowledge of quality, both in materials and workmanship.

Develop skill in spending housing dollars wisely in relation to family needs.

Become acquainted with the specialized facilities designed for elderly, vacationist, and lower income families.

Examine trends in an attempt to understand the exciting changes occurring in this basic industry.

The study of housing is the study of our close environment for all of our sleeping and much of our waking hours. We are permitted to choose in making our housing decisions. A posture for intelligent choice is the goal of the study of residential housing.

Program below relates the goals above:

RESIDENTIAL HOUSING - a series of meetings on decisions regarding site selection, house design, plans and specifications, materials and economics of house construction.

Participants - Employees of a Holyoke company (the company will be moved to Lee, Mass., in September 1967. All employees (175 families) who move must select different housing.)

Dates	Place
Nov. 9, 16, 30; Dec. 7, 1966	South Hadley Falls

Attendance - 25

Faculty - Edward K. Knapp, Assistant Professor, Extension. Management and Family Economics.

CONSUMER EDUCATION

"A free economy depends on rational consumer choice. If consumers cannot choose wisely, if they regularly reach their decisions in a state of wonder and perplexity, if they make their choices on the basis of meaningless or irrelevant claims, a free economy suffers... It is the consumer's decision that helps direct the flows of investment, of labor, of natural resources. If his decisions are based on something less than full information, the possibility of wasting capital, labor, and natural resources is increased." (Report of the Consumer Advisory Council for 1966, Washington, D.C.)

The Home Economics program in Consumer Education is directed to the principle that consumers have the right to be informed. The program has as a primary goal the competence of the consumer in the total welfare of individuals and families.

The programs listed below have as their primary goal, information and techniques concerned with quality evaluation, product performance, economic judgment and consumer protection.

ECONOMICS AND THE CONSUMER - a seminar which focused on the characteristics and the problems of the consumer - concepts of demand, pricing, quality, competition, art of selling, credit, spending patterns, law, and the consumer movement.

Participants - Professionals in Education and in Service Agencies

Dates	Place
Oct. 6, 13, 20, 27; Nov. 3, 10, 17, 1966	U. of Massachusetts/Boston

Attendance - 30

Faculty - Marjorie M. Merchant, Associate Professor, Extension. Management and Family Economics.

CONSUMER AND THE MARKET PLACE, WHDH-TV, Boston - programs emphasized changes in products, relationship of consumer expenditures and demand to availability, selection, pricing of both goods and services.

Dates	Place
Oct. 5, 12, 19, 26; Nov. 2, 9, 16, 23, 30, 1966	WHDH-TV, Boston

Faculty - Marjorie M. Merchant, Associate Professor, Extension. Management and Family Economics.

LEADERSHIP DEVELOPMENT

Leadership is to exert influence, small or great, upon an individual or a group. Leadership is also supplying a function needed by an individual or group when it is necessary -- not that anyone particular person supplies the function, but that someone does. The belief in a democracy is that leaders are everywhere in the population and can be recruited and trained to do the many leader functions necessary for society's good.

The Extension Service program offers support to leadership, declared and yet to be recruited, in the following roles: parents, service to the community, and maintaining the functions and tasks of an organization.

Leaders and professionals express the need to explore and study facets of leadership such as:

Finding and training volunteers for social and educational needs.

Relationship of the professional and the lay leader.

Functions of a council to the Extension program.

Leadership as self development and continuing education for service either volunteer or paid.

In 1962, Sears-Roebuck Foundation gave support to a statewide workshop on the Volunteer in Today's Culture, organized by the Division. The support has continued for workshops in the counties, planned by the Division and the particular county.

VOLUNTEER IN TODAY'S CULTURE - conference on new dimensions in training, relationships, supervision and expanded opportunities for the volunteer.

Participants - Professionals and Lay Volunteers

Date	Place
October 12, 1966	Plymouth County

Attendance - 125

Faculty - Dr. Ellsworth Neumann, Administrator, Massachusetts General Hospital.
Mr. Robert McCreech, Director, School and Volunteer Bureau, United Community Services of Metropolitan Boston.

MASS MEDIA

CONVERSATION - Four College Radio WFCR, Amherst.

Tapes are also used by WGBH, Boston
WAMC, Albany
WAMU, Washington, D.C.
WAER, Syracuse

Half hour weekly discussions on topics of house, home, family and community.

Typical subjects: Kinds and Costs of Credit, January 5.
Nutrition Quackery, March 30.
Food and the Nation, April 27.
Innovations in Fabrics and Fashion, May 25.
Culturally Disadvantaged and Early Childhood Experiences, February 2.

In-Service Training for County Extension Home Economists

The Division faculty has a commitment to keep the County Extension Home Economists trained in subject matter for their role as teacher. This includes training at the University, conferences in county and communications by telephone and letter. The estimated amount of work of any one Division faculty for this assignment would be 1/8 to 1/6 of his or her time.

The Division started a three year professional development program in December 1965 for both county and state Home Economists. The faculty for the program was selected from the Center for the Study of Liberal Education for Adults, Boston University. The focus has been on the adult educator working in an urban environment with individuals, families (middle income and low income), and with other agencies.

Thus far, the Center faculty has had three two-day seminars with the Home Economists plus several single day sessions for each task force. The total group has divided into three task forces which meet periodically with one faculty member of the Center.

The program has been in progress for eighteen months. Most participants are in high praise of the opportunity. Plans were made at the June 1-2 seminar to continue through 1968.

SUMMARY

This report has given only a small number of the different but typical programs organized by the Division in the year. The focus of the program has been the family and the problems of the family and individuals in the family. The county Extension staff and other professionals working with the family represent the field staff and are vital to the effort of the Division both in organizing for the Continuing Education workshops, seminars, etc., and in the Problem Centered Projects where lay teaching leaders are involved.

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APPENDIX A

GOAL: FUNCTIONAL FACILITIES FOR HOME ECONOMICS EDUCATION

...a department planned and equipped to facilitate the teaching of all areas of Home Economics, namely:

Nutrition and Food
Textiles and Clothing
Housing, Home Furnishings, and Equipment
Child Development and Family Relations
Family Economics and Management

...this necessitates adequate and adjustable space for individual and group work, modern equipment, and conveniently placed storage for all supplies and mobile equipment when not in use.

PURPOSE:

UNDERGRADUATE

...to prepare teachers for programs of education for Homemaking at the Junior and Senior High Schools

...to prepare teachers for programs of education for occupational employment in secondary, technical, and post-secondary schools.

...to prepare teachers of Home Economics for the Peace Corps and Vista

...to prepare teachers for programs in Adult Education, Cooperative Extension, and special programs in urban education

...to prepare home economists for employment in business:

Consumer Service Departments
Utility Companies
Journalism - newspapers, books, magazines
Television and Radio

— — —

GRADUATE

...to provide graduate programs of Home Economics Education featuring an area of concentration

...to provide in-service programs of education at the graduate level

...to conduct research at the graduate level.

The Multipurpose Laboratory will be equipped as a Center for Learning. It is planned to meet the instructional needs of the undergraduate, graduate, and transient graduate student. 75% of the activities which occur in the multipurpose laboratory do so simultaneously. An estimated 25% occur in the nature of large group instruction.

Examples of activities:

1. Pre-testing...written and applied.
2. Teacher-pupil planning utilizing appropriate audio-visual aids.
3. Large group lecture presentation - use of appropriate audio-visual aids...overhead projector, tape recorder, phonograph, flannel board, etc.
4. Small group discussions, buzz sessions, brainstorming.
5. Demonstrations: Teaching of techniques appropriate to content areas in Home Economics Education, i.e., the scientific principle of insulation may be taught by baking a Baked Alaska.
6. Role Playing...in Family Life Education; Child Development.
7. Sociodrama.
8. Use of Puppetry...Family Life Education at JHS level.
9. Debates.
10. Outside speakers meeting specialized groups; use of films, film strips, films, overheads, etc.
11. Individual Research and Study -

    Examples:

    a. New products resulting from advances in technology such as man-made fibers and/or special treated fabrics such as those labeled permanent press.

    b. Foods preserved by new processes...58 varieties of spuds now on the market.

    c. Marketing research: #1 impulse item in the Greater Boston supermarkets in 1966 was aspirins.

    Topics such as: Changing Regulations in the Adoption of Children; Modified Extended Kin Relationships and Their Implications for Family Life Education; Child Rearing Practices, 1929-1967; etc.

12. Team Learning.
13. Team Teaching.
14. Preparation of audio-visual materials for student teaching.

EXAMPLE OF SPACE UTILIZATION & ADAPTATION

Area: The Experimental Foods Kitchen

1. Foods Demonstrations with critical analysis related to one of three audiences: Secondary School Groups, Homemaker Groups and TV audience.

2. Food Preparation and Experimentation
...to perfect a skill, to conduct time and motion studies, to develop a new product, to establish a concept in Human Nutrition.

3. Equipment Demonstration, Consumer Education and Research
...analysis of appropriateness of equipment for school use, homemaker, mentally retarded pupil, handicapped homemaker, etc.

The Living-Dining Area

1. The teaching of Housing, Home Furnishings, Home Decorating.

2. Discussions related to Family Life Education.

3. Discussions related to Child Development.

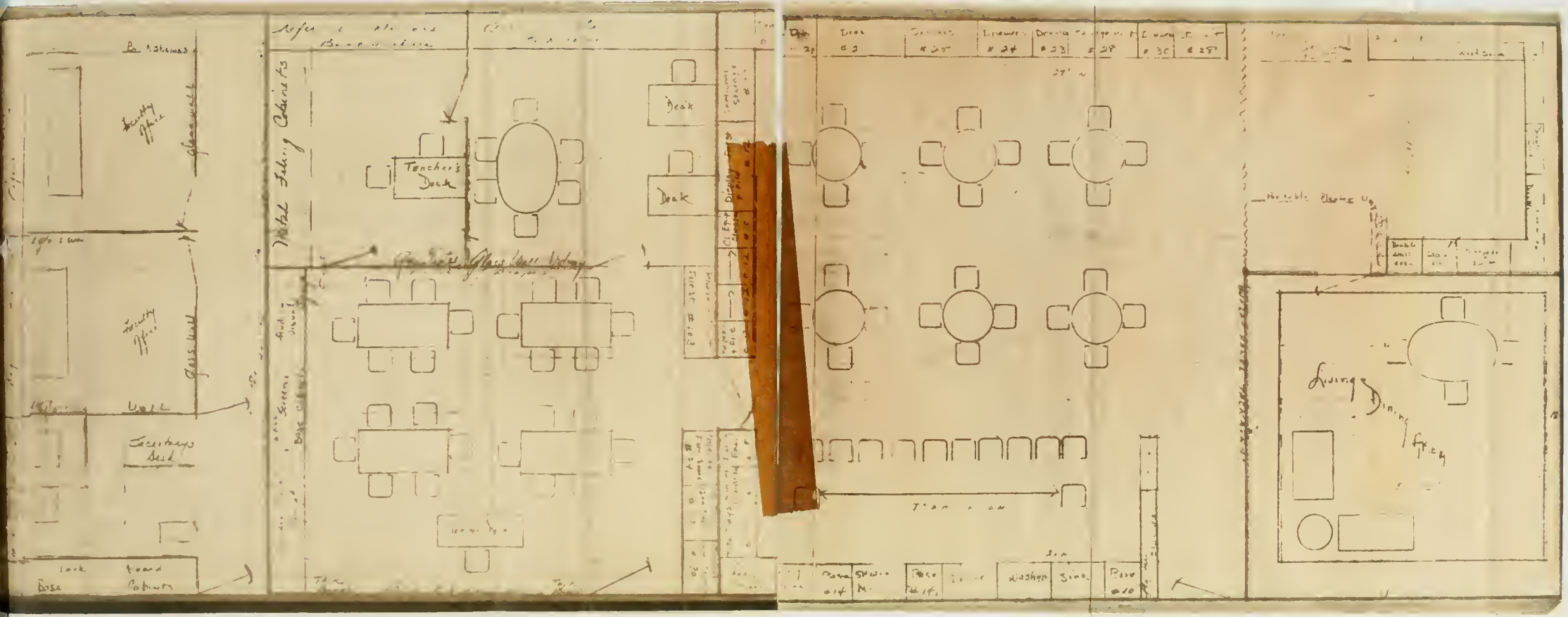
4. Adaptation to Occupational Education related to Home Economics...example: Food Service.
5. Adaptation for Child Study Laboratory in a secondary school.

* * * * *

ESTIMATED COST

Specialized Facilities and Equipment for
INSTRUCTION AND RESEARCH IN HOME
ECONOMICS EDUCATION....

Large Equipment...	$25,000.00
Small equipment and Essential teaching aids	7,500.00



UNIVERSITY OF MASSACHUSETTS

SCHOOL OF NURSING

ANNUAL REPORT

July 1, 1966 - June 30, 1967

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UNIVERSITY OF MASSACHUSETTS
School of Nursing

July 1, 1966 - June 30, 1967

From: Mary A. Maher, Dean, School of Nursing

To: Dr. John W. Lederle, President, University of Massachusetts

Subject: Annual Report of the School of Nursing -
July 1, 1966 - June 30, 1967

Dear President Lederle:

It is my pleasure to submit herein the report of the School of Nursing for the fiscal year 1967; prepared according to the format received from the Office of R. J. McCartney, Secretary of the University.

May I take this opportunity to express my appreciation and that of the faculty for your continued administrative support and understanding.

Most sincerely,

Mary A. Maher

Mary A. Maher, Dean
School of Nursing

MAM:mmr

UNIVERSITY OF MASSACHUSETTS
School of Nursing

ANNUAL REPORT

July 1, 1966 - June 30, 1967

I. Appropriation: (State)

FISCAL YEAR	APPROPRIATION
1964-1965	$24,700.00
1965-1966	$20,600.00
1966-1967	$26,200.00

II. Personnel:

Professional -

Rank	Number of Personnel Sept. 1964	Sept. 1965	Sept. 1966
Dean	1	1	1
Associate Dean	1*	1	1**
Professor	2	2	2
Associate Professor	1	2	3
Assistant Professor	5	5	9***
Instructor	4	12	11
Total	14	23	27

Secretarial -

Principal Clerk	1	1	1
Junior Clerk-Stenographer	-	1	2
Junior Clerk-Typist	1	1	1
Total	2	3	4

* Sabbatical Leave, 1964-1965.
** Educational Leave, February 1, 1967 through August 31, 1967.
*** Two (2) Assistant Professors paid by Mental Health Grant.

2a. Appointments, Promotions, Resignations - Fiscal, 1967:

Undergraduate Program:

New Appointments (N) or Replacements (R)

Date	Name	Rank	Clinical Area	N	R
9/66	Virginia Earles	Associate Professor	Medical & Surgical	X	
"	Karen Johnson	Instructor	Medical & Surgical	X	
"	May B. Hall	Assistant Professor	Psychiatric-Mental Health		X
"	Charlotte Hoglund	Instructor	Psychiatric-Mental Health		X
"	Derry Mortiz	Instructor	Medical & Surgical	X	
"	Martha Newman	Instructor	Maternal & Child		X
"	Loretta Sharp	Associate Professor	Pediatrics	X	
"	Helen Whitbeck	Assistant Professor	Psychiatric-Mental Health		X
	Total			4	4

Promotions

Date	Name	From	To	Clinical Area
1/31/67	Jane Nicholson	Instructor	Assistant Professor	Medical & Surgical
1/31/67	Dorothy Sexton	Instructor	Assistant Professor	Medical & Surgical
1/31/67	E. Ann Sheridan	Instructor	Assistant Professor	Pediatrics

Resignations

Name	Rank	Area	Date	Length of Service
Mary E. Macdonald	Associate Dean	Administration	8/31/67	13 yrs.
Ida M. MacDonald	Associate Professor	Graduate Program	8/31/67	2 yrs.
Rita E. Kisting	Instructor	Medical & Surgical	8/31/67	2 yrs.
H. Constance Mather	Instructor	Medical & Surgical	8/31/67	4 yrs.
Mary J. Schank	Instructor	Medical & Surgical	8/31/67	2 yrs.

3. Organizational Charts:

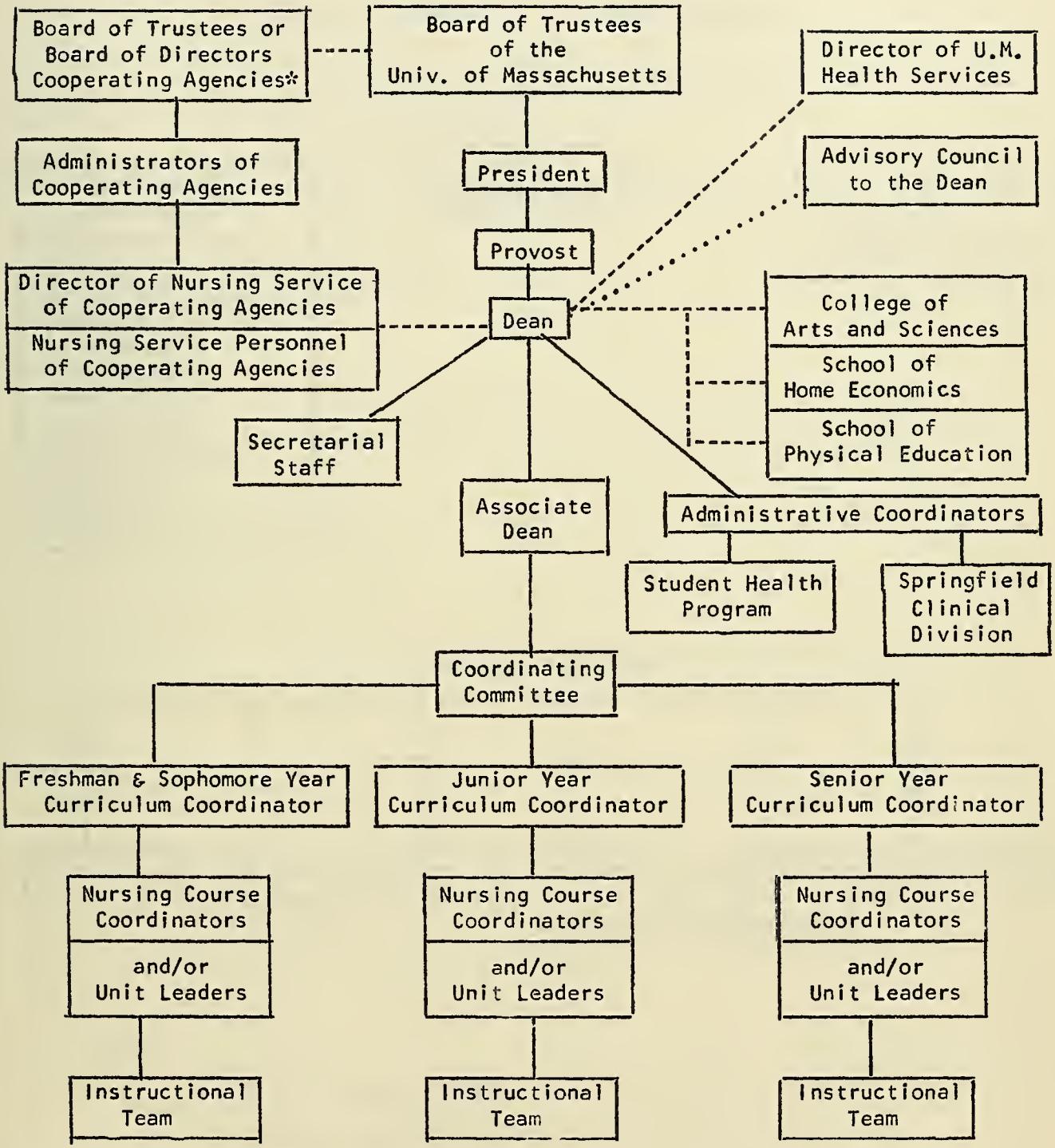
Functional Organization - Chart I - page 3a.
Faculty Organization - Chart II - page 3b.

4. Students and Clientele Served:

Category	Sept. 1964	Sept. 1965	Sept. 1966
Baccalaureate Program:			
Nursing Majors	146	178	253
Job-Related Work Conferences for Registered Nurses in Practice (Summer)	-	25	38
New England Board of Higher Education for Nursing Work Conferences for Supervisors and Head Nurses - "Improvement of Nursing Care" (Fall and Spring - 5 days each)	72	92	75
New England Board of Higher Education for Nursing Work Conference for Registered Nurse Directors and Supervisors of Nursing Homes	-	-	30
Total Graduate Nurses	72	117	143

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Functional Chart of Organization



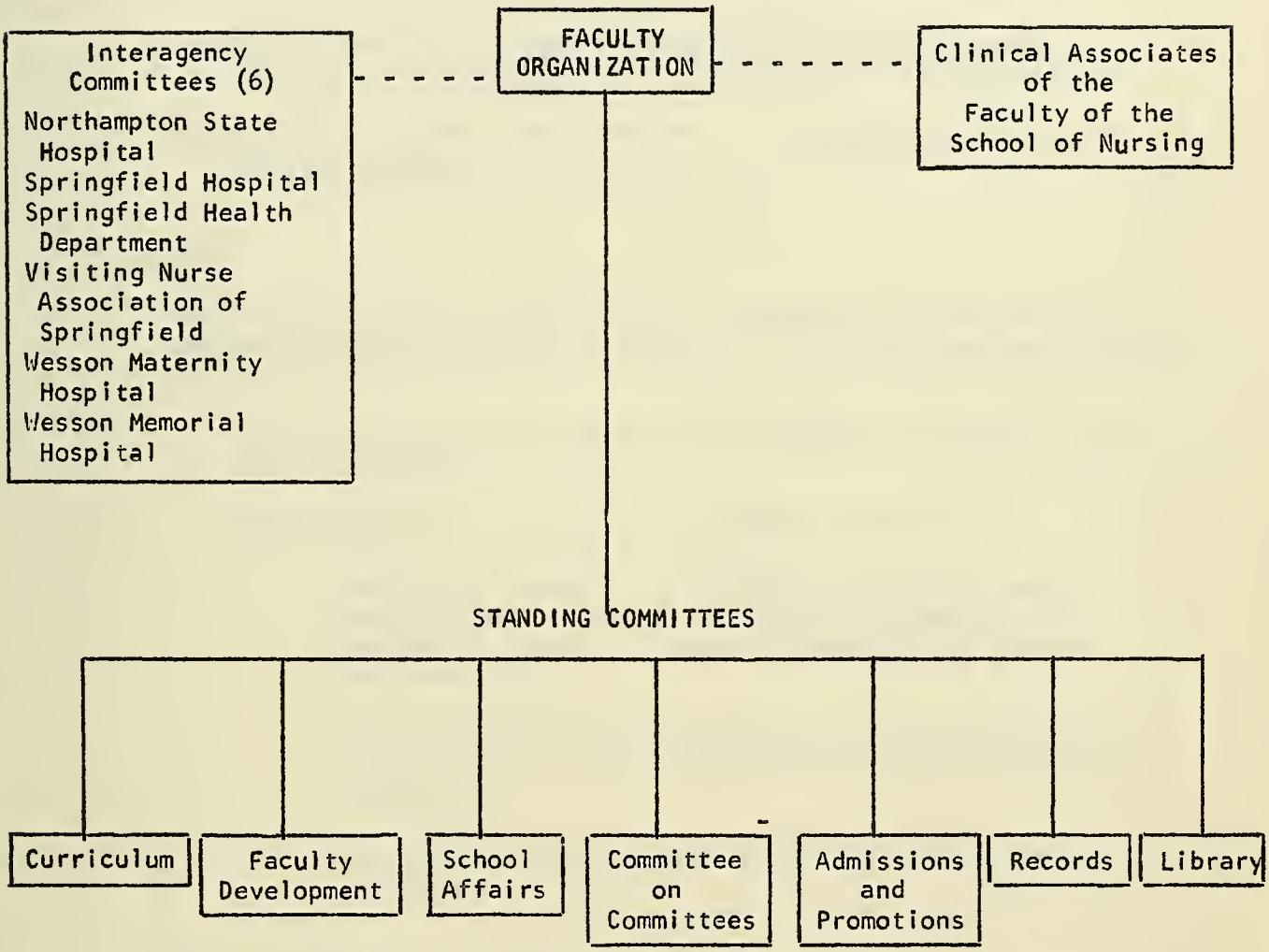
Legend: _____ Direct responsibility
- - - - Collaborative relationship
..... Advisory relationship
* Six Cooperating Agencies

Revised: 4/24/67

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Faculty Organization of School of Nursing

1966-67



Legend:

_____ Direct responsibility

- - - Advisory relationship

5. Publications, Research Grants, Research Projects and Other Professional Activities:

a. Publications -

Hall, Mae B. and Whitbeck, Helen M. (Editorial Committee). Proceedings of Clinical Workshop in Psychiatric Nursing. University of Maryland School of Nursing, 1966. p. 214.

Martocchio, Benita C. Study of Alumnae of School of Nursing - University of Massachusetts - 1954-1966. (In progress)

Moritz, Derry A. and Sexton, Dorothy L. Evaluation of Clinical Nursing Practice. (In process)

b. Grants -

National Institute of Mental Health - INTEGRATION OF PSYCHIATRIC AND MENTAL HEALTH CONCEPTS IN NURSING - in the Baccalaureate Nursing Program.

The School received a grant for the eleventh consecutive year ($25,432.02).

The continuity of the grant has made it possible to:

- award a traineeship to two senior students; one of whom has been accepted for the fall class at the Columbia University Program in Psychiatric Nursing, New York City.

- continue to purchase psychiatric services from the University Health Service for our Faculty Development Program.

- purchase additional audio-visual aids for teaching purposes.

c. Professional Activities of the Faculty:

(See Appendix B and C)

6. Major Accomplishments of School of Nursing - 1966-67: Undergraduate Program

I. Revision of Philosophy and Educational Objectives -

A revision of the philosophy and of the educational objectives of the School of Nursing was viewed by the faculty as being basic to future curriculum development.

Through the concerted efforts of the Curriculum Committee, a Statement of the Philosophy and the Educational Objectives was formulated, reviewed, and discussed by the faculty. Except for some minor

revisions, the Statement was accepted by the faculty. (See Appendix D)

II. The Role of the University School of Nursing -

In view of the interest of Presidents of State Colleges in Massachusetts in establishing baccalaureate nursing programs, it appears eminent that the Position of the University School of Nursing will be clarified. (See Appendix E)

A Position Paper will give direction to the nature of the educational offerings of the School of Nursing, including admission standards, curriculum offerings, projected planning, and the like.

III. Student Achievement -

Unquestionably, the students' high achievement brings the greatest single satisfaction which the students and faculty experience.

Honors at Graduation: (34 graduating)

*Summa Cum Laude	1	(* Elinor Scott was one of 6 members of the University graduating class - 1967 - one of two women to receive this honor.)
Magna Cum Laude	1	
Cum Laude	6	

Dean's List -(Cumulatibe Quality Point Average of 3.0 or Higher)

Fall, 1966		Spring, 1967	
Class of 1967 -	7	Class of 1967 -	8
Class of 1968 -	9	Class of 1968 -	12
Class of 1969 -	12	Class of 1969 -	10
Class of 1970 -	17	Class of 1970 -	13
Total:	45		43

Special Problems Seminar -

Each junior student, electing to register for the Special Problems Seminar, is oriented to research methodology and to the skills essential for selecting problems for study, and developing a research design. The study is completed during the Senior Year. Continuity of the Preceptor throughout the process of design and implementation of the study has been extremely helpful to the student. The student presents her study to the faculty and to interested nursing students.

Studies Completed - 1967:

1. Use of Kardex as a Means of Communicating Information to Improve Continuity of Nursing Care.

   Hope Barker, Student
   Rita Kisting, Preceptor

2. Identification of Factors Predisposing the Formation of Decubitus Areas.

   Ann Burke, Student
   Alice Norman, Preceptor

3. Identification of Fears Common to Adult Pre-operative Patients

Eileen Burke, Student
Charlene Phelps, Preceptor

4. Investigation of the Influence of Knowledge Concerning a Diagnosis of Cancer on Selected Areas of Interpersonal Behavior in the Hospitalized Adult

Sandra Isenor, Student
Mary E. Macdonald, Preceptor
Dorothy L. Sexton, Preceptor

Extended Practice (Psychiatric Nursing) -

Two senior students, demonstrating considerable depth of understanding of the mentally disabled patient, and the therapeutic role of the professional nurse, requested permission to extend their practice with the patient with whom they had been working over the Spring Recess. Both patients (male) were diagnosed as schizophrenics; neither had shown progress throughout a rather long period of hospitalization. The students and the faculty member felt very much encouraged with the progress of the patients.

The extended practice period was supervised by a Psychiatric-Mental Health faculty member.

Students: Margaret Hickox
Elinor Scott

Faculty Member: Charlotte Hoglund

IV. Special Project:

Promotion of a Neighborhood Health Center and a Teaching Resource for the School of Nursing (See 1966 Annual Report, pg. 12)

Efforts in promoting a Neighborhood Health Center in an economically deprived section of Springfield have continued by a special committee of the faculty chaired by the Assistant Professor of Public Health Nursing. Considerable interest was evidenced by the Springfield Office of Economic Opportunity - and the Community Council of Springfield. A direct approach was made to the Hampden County Medical Society's Public Health Committee for the purpose of interpreting the needs of the people, and to invite the Medical Society to co-sponsor a project which we felt reasonably sure would be funded by the Office of Economic Opportunity. Regardless of the facts presented (all of which had been carefully collected and well documented), the Public Health Committee felt that "the medical resources in Springfield to be adequate and readily accessible to all people, therefore, the Society could not co-sponsor such a project".

Efforts have continued, however, primarily due to the interest of the Director of the Office of Economic Opportunity; the Executive Director of the Community Council of Springfield; and the faculty of the School of Nursing. We need now to revise our plans, and to begin rather modestly by establishing a sub-station for Public Health Nursing in the deprived area. The physical presence of our Public Health Faculty and students enrolled in Community Nursing at this sub-station will serve to assure the residents of this area of the accessibility of nursing care. Presently it is anticipated that rooms for offices and conferences may be available to us on the first floor of the Housing Project located in the Brightwood area by September.

V. Faculty Development:

The commitment of the faculty to keeping abreast of the rapid growth in knowledge and its implications for the improvement of patient care, and for nursing education continues.

While each faculty member assumes the responsibility for ever seeking new knowledge in her special and related field through independent study, opportunities have been provided for:

1) attendance at regional, national and state professional meetings by faculty representing the School. The content of each meeting has been shared with the entire faculty at a meeting planned for this purpose.

2) participation in the annual Interuniversity Faculty Work Conference sponsored each year (since 1964) by the New England Council on Higher Education for the faculties of baccalaureate nursing programs in New England. Funding by the U.S.P.H. Service, Division of Nursing, has made it possible to interest outstanding practicing teachers and researchers to become faculty members for these work conferences. New knowledge is shared simultaneously by approximately 200 participants, and the dialogue between the faculty functioning in the various programs becomes focused and meaningful.

3) attendance at work conferences in a specialized area of nursing.

4) Group Work - Interested faculty have participated weekly in group work under the leadership of the senior psychiatrist of the University Health Service. Two groups of 6 to 8 have met weekly throughout the year for the purpose of improving group interaction and productivity. The outcome of the experience, while intangible, appears to have had a positive influence on the individual faculty member's functioning as a person; as a member of an instructional team; and/or as a committee member.

5) Pre-school Faculty Work Conferences - A faculty work conference prior to the beginning of the school year (financed by the faculty) was held at an off-campus location early in September, 1966. The content included topics of interest to new faculty, and discussion of recurring problem areas related to curriculum and teaching. The success of the experiment is evidenced by the plan for a second such work conference in September, 1967.

6) Distinguished Lecturer - This year it was possible to interest Dr. Hans Mauksch, a noted medical sociologist, and presently Dean, Institute of Liberal Arts, Chicago, Illinois, to meet with the faculty and students. Dr. Mauksch's former, though recent, long and colorful experience as Director of Research, Department of Behavioral Sciences, in a large metropolitan hospital served to familiarize him with the need for the professional nurse to identify and extend her leadership role in health agencies.

7) Sabbatical Leave - To date, one faculty member has availaed herself of sabbatical leave for doctoral study. It is anticipated that other eligible faculty members will avail themselves of this opportunity during 1967-1968.

VI. Admission of Registered Nurses to the Baccalaureate Nursing Program:

The faculty has, for some years, been cognizant of the need to provide Registered Nurses (from diploma and associate degree nursing programs) with the opportunity to complete the requirements for a baccalaureate degree.

It has been agreed that the School should share this responsibility with accredited private collegiate schools of nursing in Massachusetts until such time as other state Institutions of Higher Education offering a baccalaureate nursing program are able to assume this role. Policies and practices are expected to be developed during 1967-68.

GRADUATE PROGRAM:

In May, 1966, the Council of the Graduate School and the University Senate approved the initial Graduate Program In Nursing leading to a Master's in Nursing Administration.

Inasmuch as Federal traineeships are available to graduate students attending a program which is accredited by the National League for Nursing or one that has "Reasonable Assurance of Accreditation", an application was submitted for reasonable assurance, to the National League for Nursing, Department of Baccalaureate and Higher Degree Programs, in July, 1966.

Two League Visitors came to the School on September 14th, and on October 11th we were notified that the program had not received "reasonable assurance of accreditation".

Our School's Committee on Graduate Programs recommended that the action of the League's Review Panel not be challenged. The Committee elected rather to redesign the program. The fact that one of our recently appointed faculty members had directed a similar graduate program in an accredited University School of Nursing influenced their decision.

The original program, leading to a Master's in Administration of Nursing was designed to prepare its graduates in the functional area of administration. Actually, the curriculum was focused on the preparation of the Directors of Nursing Services in a hospital.

The new program, leading to a Master of Science in Nursing, is designed to prepare its graduates for positions of leadership in nursing related to a

clinical field. All students will carry 36 credit hours in an area designated as clinical nursing. They may then elect to take 12 credit hours in a functional area such as teaching; administration; or additional credit hours in a clinical nursing area.

A program in Medical and Surgical Nursing was designated as the initial Graduate Program. A qualified faculty member was employed in September, 1966 for this purpose. The basic curriculum design also lends itself well for graduate programs in other clinical nursing areas.

Several inquiries have been made as regard admission for the Fall of 1967. The lack of traineeships (Federal) will no doubt materially influence the number who can enroll.

The School of Nursing will be visited in the Spring of 1968 (8-year review) by the National League for Nursing as regards the accreditation status of the baccalaureate program. At this time, the Graduate Program will also be reviewed.

Psychiatric Nursing -

The initiation of a program in Psychiatric Nursing will be delayed until clinical resources in the area suitable for a graduate program are available. The projected Mental Health Center for the Springfield region has been delayed due to the lack of appropriation of funds. The future is beginning to look much more hopeful as Federal Funds are becoming more readily available to states having a Comprehensive Mental Health Plan.

7. Challenges Confronting the School:

Problems viewed as challenges serve to stimulate a fresh approach to situations which previously appeared most disenchanting.

Admissions to Baccalaureate Nursing Program (Freshmen) -

A freshman class of 100 each year commencing in 1966 had been projected. It is increasingly apparent that the use of existing resources must be maximized and new resources must be explored.

Year	1963	1964	1965	1966	1967	% Increase 5-yr. Period
Number of Students	54	71	79	93	90 (approx.)	66 2/3

Factors influencing admissions:

1. Availability of scholarships for highly qualified high school graduates in private baccalaureate nursing programs, and subsequent withdrawal after acceptance to the University.

2. Delay in notifying students of acceptance after School of Nursing interview.

No. Interviewed	135
No. Accepted	133
No. Withdrawals After Acceptance	38

APPROACH TO THE PROBLEM -

The faculty has given serious consideration to the problems and have sought their solution.

1. Retention of Candidates:

a. Scholarships (Federal) -

The availability of Opportunity Grants in September, 1967 (Scholarships) for students of nursing, meeting the eligibility criteria, should prove to be helpful to the students who may otherwise be unable to enter a nursing program. A grant (Scholarship) of not less $200 or more than $800 should make it possible to reduce the number of highly qualified candidates withdrawing after acceptance.

b. Interviews -

While the School reserves the right to interview prospective candidates, whenever indicated, routinely scheduled interviews will be discontinued for high school graduates meeting the admission requirements. The time interval between the acceptance of the candidate by the Admissions Office and notification of acceptance should be reduced to a minimum.

c. Limitation in Clinical Resources and Facilities -

(1) of the 3 General Hospitals utilized as clinical laboratories by the School of Nursing, 2 have a diploma program, and all 3 General and the 1 specialized hospital provide clinical experience for students from Practical Nurse Programs.

(2) changes in hospital population - Wesson Maternity = decrease in number of deliveries; Springfield Hospital = fewer children hospitalized (Pediatric Service)

2. Extension of Learning Experiences to the Home and Community:

   a. Teaching -

      Maternal and newborn nursing and public health nursing previously taught as two courses will be taught concurrently. The faculty team responsible for these courses felt it timely to critically study the content and learning experiences of each course. As a result of this study, and deliberation, it was recommended that commencing in September, 1967 Maternal and Newborn Nursing be taught concurrently with Public Health Nursing throughout a semester. It is anticipated that duplication of course content will be eliminated and that the students will have more meaningful learning experiences. The faculty plans to extend the out-of-hospital experience during the junior and senior year.

   b. New Clinical Resources -

      There still exists additional clinical resources in Western Massachusetts which should be evaluated as to their suitability for students' learning.

      Tentatively we are thinking of a potential clinical division encompassing resources in the Amherst-Northampton-Holyoke in addition to the Springfield Clinical Division.

   c. Dearth of Qualified Faculty -

      Our School has adhered to the requirement of a "not less than Master's degree", with a major in the clinical area for which the faculty member assumes responsibility, as a standard in recruitment.

      The annual number of graduates from Master's programs continues to be a critical problem, especially in the clinical areas of Maternity Nursing and Nursing Fundamentals.

Enrollments, Graduations, and Accreditation Status --
Masters Degree Programs, 1966*

Accreditation Status (Jan., 1967)	Number of Programs	Number of Enrollments (Fall, 1966)				Number of Graduations	
		Full-Time	Part-Time	Total	Percent of Total	Total	Percent of Total
Accredited	42	2586	622	3208	92.0	1174	91.8
Nonaccredited	17	181	99	280	8.0	105	8.2
Total	59	2767	721	3488	100.0	1279	100.0

In the fall semester of 1966, there were 42 accredited masters programs with an enrollment of 3,208 students, 92 percent of all students enrolled in masters programs. (See table above.) Of the 17 nonaccredited masters programs, 3 opened during the past year. The number of graduates from accredited and nonaccredited programs assumes approximately the same proportions as the enrollment statistics.

---

* Source:

National League for Nursing. Some Statistics on Baccalaureate and Higher Degree Programs in Nursing, 1966. New York, New York. Table 5. page 3.

Full-Time Enrollments--Masters Programs, Fall, 1966,
by Nursing Focus and Functional Purpose of Curriculum*

Nursing Focus	Number of Enrollments by Functional Purpose of Programs							
	Administration							
	Service	Education	Supervision	Teaching	Supervision & Teaching	Advanced Practice	Not Designated	Total
Medical-Surgical			171	561		247		979
1. Medical-surgical			131	532		218		
2. Specialties			40	29		29		
Maternal-Child			65	256		92	2	415
1. Maternal-child			48	177		63	2	
2. Maternity			7	17		10		
3. Pediatrics			10	62		19		
Psychiatric-mental Health			136	300	4	291		731
Public Health Nursing	47		123	141		40		351
1. Public Health	47		123	141		24		
2. School nursing						16		
Other (sciences, fundamentals)				2				2
None	190	77	1					268
Not designated			3			4	14	21
Total	237	77	499	1260	4	674	16	2767

The total full-time enrollment in masters programs has increased by approximately 400. The most marked change in the distribution of this full-time enrollment has taken place in the area of supervision. There has been a marked increase in the number preparing at the masters level for supervision in all four of the specific areas of nursing focus as categorized in table above. The only functional area that has shown a decrease is that of supervision and teaching, and this is compensated for in the increase in the separated functions of supervision and teaching.

* ibid. Table 7. page 4.

The ratio of graduations from Master's programs to graduations from baccalaureate programs has again shifted. While the ratio of Master's graduations in all fields in the United States has steadily shown more students going on for masters degrees over the past 8 years, the same trend does not pertain in nursing. (1966 decrease in masters graduations and a continued increase in the number of baccalaureate degrees in nursing has effected the ratio.)

Ratio of Graduations from Masters and Baccalaureate Programs in Nursing, 1958-66*

Academic Year	Number of Graduations				Ratio of Graduations--Masters to Baccalaureate	
		Baccalaureate				
	Masters	Basic	RN	Total	In Nursing	In U.S.[1]
1965-66	1279	5498	2386	7884	1 - 6.2	1 - 4.2
1964-65	1379	5381	2254	7635	1 - 5.5	1 - 4.8
1963-64	1282	5059	2445	7504	1 - 5.9	1 - 4.9
1962-63	1149	4481	2319	6800	1 - 5.9	1 - 5.0
1961-62	1098	4300	2353	6653	1 - 6.1	1 - 5.1
1960-61	1009	4028	2456	6484	1 - 6.4	1 - 5.3
1959-60	1197	4136	2520	6656	1 - 5.6	1 - 5.5
1958-59	1092	3943	2301	6244	1 - 5.7	1 - 5.6

[1] United States Department of Health, Education, and Welfare, Office of Education, Digest of Educational Statistics, 1959-66 editions, Washington: U.S. Government Printing Office.

Graduations from Baccalaureate Programs, 1966, by Accreditation Status as of January, 1967*

Accreditation Status	Basic Students		Registered Nurse Students	
	Number of Programs	Number of Graduations	Number of Programs	Number of Graduations
Accredited	147+	5050	102	1815
Nonaccredited	63	448	100	571
Total	210	5498	202	2386

+ Includes one masters program that prepares for initial practice.

* Source: ibid. Table 9. page 6.

* Source: ibid. Table 12. page 8.

The inadequate supply of qualified clinical nursing faculty for the various types of basic nursing programs and for graduate programs is one of the most critical problems facing nursing, and indeed, the nation today. While the number of Federal traineeships have increased from 1957-67, the number of candidates studying for a Masters, post-masters and doctoral degree in nursing on a part-time basis continues to delay the availability of potential faculty to schools of nursing.

d. Projected Planning and Hope for the Future -

A comprehensive study of nursing and nursing education in the United States is to be made by an independent National Commission established on May 10, 1967 by the American Nurses Association and the National League for Nursing. The work of the National Commission will be supported by grants of $100,000 each from the Avalon Foundation and the W. K. Kellogg Foundation, and $300,000 from an anonymous donor. A 15-member autonomous commission will function under the leadership of Dr. W. Allen Wallis, President of the University of Rochester, New York. Members will include persons prominent in the fields of the health disciplines of higher education, social and physical sciences, and business; a director will head the staff and conduct the study.

The Commission will, over a two-year period:

1. Delineate reasonable expectations for nursing care and nursing service needs.

2. Assess the resources required for safe, effective, and economical nursing and for the education of nursing personnel.

3. Identify major obstacles to effective nursing and nursing education.

4. Assess nursing education and service in terms of the leadership and preparation required to provide high quality nursing care.

5. Recommend means for making quality nursing service broadly accessible

Study of Nursing and Nursing Education in Massachusetts -

The Board of Higher Education in Massachusetts, under the leadership of Chancellor Dr. Richard Millard, has earmrked $15,000 (Federal Funds) for the Study of Nursing in Massachusetts. The appointed director plans to initiate the study in the fall of 1967.

Dr. Millard has appointed a Nursing Advisory Committee who is to work closely with him and the Study Director.

- Masters and Higher Degree Programs -
  Dr. Anne Kibrick

- Baccalaureate Nursing Programs -
  Mary E. Macdonald

- Associate Degree Programs -
  Dr. Rita Forest

- Diploma Programs -
  Sr. Madeleine Clemence

- New England Council on Higher Education in Nursing -
  Mrs. Winifred Griffin

8. Future Needs and Plans:

I. SCHOOL OF NURSING FACILITY -

The need for a School of Nursing facility has been submitted and justified over the past six years.

Our request for capital outlay, originally fairly high on the priority list prepared by the Master Planning Committee, has been placed in a lower and lower priority position.

It is less than flattering to learn that parents and students coming to the University have great difficulty in locating the School. Housed in the North Wing (4th floor) Western Massachusetts Public Health Center and the East Wing (4th floor) Morrill Science Building, the School's identity is obscured. Originally, the fourth floor of Morrill IV (Section 4 North and East) was designed and furnished for the School of Nursing. Space planned for the offices of new faculty members has been usurped by other educational units of the University requiring classrooms. As a consequence, faculty offices, purposely designed for one person (9 x 12), are presently occupied by two and three.

While public and private accredited Schools of Nursing continue to capitalize on the availability of Federal Construction Grants for new school of nursing facilities, our need remains unmet.

II. ADDITIONAL FINANCIAL AID FOR STUDENTS -

Federal Aid through scholarships (Educational Opportunity Grants) and Loans for Students of Nursing are sources of financial aid to students. The availability of such aid is dependent upon the amount of money allocated from University funds for matching purposes. Not infrequently the student of nursing is the oldest of a family of 4 or 5 children and parents find financing a college education a real hardship. Approximately 50% of the students would meet the eligibility criteria for Educational Opportunity Grants (scholarships).

III. CLINICAL NURSING LABORATORIES -

Additional clinical resources and facilities must be identified and evaluated as to their suitability for nursing laboratories during the coming year.

- SCHOOL OF NURSING - MEDICAL CENTER COLLABORATION:

The Advisory Council to the Dean of the School of Nursing recommended to the Dean of the Medical School the appointment of a qualified nurse who would serve in the capacity of Chief of Nursing Practice at the University Hospital. (Hospital to be completed by 1971.) Such a person would work directly with the already appointed Hospital Administrator directing her attention to the consideration of many factors influencing the quality of nursing care. The possibility of a dual appointment wherein the Chief of Nursing Practice of the University Hospital would also be a member of the

faculty of the School of Nursing was enthusiastically endorsed.

Two faculty members visited the University of Florida Medical Center, March 6-9, 1967, for the purpose of studying and evaluating the organization of nursing service at the University of Florida Hospital, and the relation of the service program to the School of Nursing and educational program. A report was prepared, and the impressions gleaned from the first hand observation and conferences with key nursing personnel were shared with the Dean's Advisory Council. The report will serve as a basis for discussion with the Administrator of the University Hospital.

Graduate Program - Advanced planning for the use of the University Hospital by graduate students can go forward as soon as the Chief of Nursing Practice is appointed, and the Hospital becomes an operating facility.

IV. FACULTY -

The availability of qualified faculty continues to be one of the major problems confronting the School. Younger faculty members feel obligated to pursue study for a doctoral degree in view of the recently established criteria of the National League for Nursing among which the following is stated: "a portion of the faculty of an accredited school of nursing should hold a doctoral degree". The possibility of being recommended for sabbatical leave in their seventh year of continuous service at the University has little appeal. The present sabbatical year policy unquestionably has merit for the majority of University faculty members who already hold a doctoral degree. The problem, however, is quite different for the faculty of the School of Nursing. While a complete change in the policy may not be feasible, it would appear that faculty members who have demonstrated meritorious work over a three year period may be recommended for educational leave with salary.

V. NATIONAL LEAGUE FOR NURSING - REEVALUATION OF THE PROGRAM -

In accordance with the National League for Nursing policy of periodic reevaluation of accredited programs in nursing, a school is revisited every eight years. Our revisit is due in the Spring of 1968.

It is anticipated that the unfilled clinical faculty positions can be filled before September, 1967 (Maternity Nursing, Medical and Surgical Nursing, and Nursing Fundamentals). The search for an Associate Dean has been initiated. The candidates are few. While all phases of the program will be evaluated, the curriculum and faculty are reviewed most critically.

VI. REORGANIZATION OF NON-PROFESSIONAL STAFF -

Reorganization of the non-professional office staff is overdue. The complexity of the many tasks assumed by the secretarial staff, and not infrequently by the faculty, requires the appointment of an Administrative Head Clerk who will assume the responsibilities for many of the non-professional activities, and the supervision of the less experienced secretarial staff.

SUMMARY:

The year ahead holds many challenges! The immediate and future planning for the School of Nursing will continue to utilize the concerted efforts of the entire faculty.

UNIVERSITY OF MASSACHUSETTS
School of Nursing

FACULTY

1966-67

Full-time

Administration:

Miss Mary A. Maher, R.N. (Rhode Island Hospital School of Nursing); B.S. (Columbia University); M.A. (Columbia University)

Dean, School of Nursing

Miss Mary E. Macdonald, A.B. (Emmanuel College); R.N. (Massachusetts General Hospital School of Nursing); M.A. (Columbia University); Pre-doctoral Study (Boston College School of Education)

Associate Dean and Professor of Nursing Education

Maternal and Child Nursing:

Miss Gellestrina T. DiMaggio, A.B. (Connecticut College for Women); M.N. (Yale University School of Nursing); M.A. (Columbia University)

Professor, Maternal and Child Nursing

Miss Martha L. Newman, B.S. (University of Cincinnati College of Nursing and Health); M.S. (University of Cincinnati)

Instructor, Maternal and Child Nursing

Miss Loretta R. Sharp, B.S. (University of Colorado); M.A. (University of Chicago)

Associate Professor, Maternal and Child Nursing

Miss E. Ann Sheridan, R.N. (Catherine Laboure School of Nursing); B.S. (Boston College); M.S. (University of Pennsylvania)

Assistant Professor, Maternal and Child Nursing

Miss Edith G. Walker, R.N. (Episcopal Hospital of Philadelphia); B.S.N.E. (University of Pennsylvania); M.A. (Columbia University)

Assistant Professor, Maternal and Child Nursing

Nursing of the Adult:

Miss Elizabeth A. Clarke, A.B. (Mt. Holyoke College); M.S. (Columbia University); M.N. (Yale University School of Nursing)

Assistant Professor, Medical and Surgical Nursing

Miss Mary F. Condron, R.N. (St. Francis Hospital School of Nursing); B.S.N.E. (The Catholic University of America); M.S.N. (The Catholic University of America)

Assistant Professor, Medical and Surgical Nursing

Miss Virginia Earles, B.S. (Syracuse University); M.S.N.E. (Syracuse University)

Associate Professor, Medical and Surgical Nursing

Miss Mary E. Gilmore, R.N. (Massachusetts General Hospital School of Nursing); B.S. (Simmons College); M.S.N. (The Catholic University of America)

Professor of Nursing

Miss Karen R. Johnson, B.S. (Hamline University); M.Ed. (University of Minnesota)

Instructor, Medical and Surgical Nursing

Miss Rita Kisting, B.S.N. (University of Wisconsin School of Nursing); M.S. (University of Colorado)

Instructor, Medical and Surgical Nursing

Miss Benita C. Martocchio, B.S. (Hartford College); R.N. (Hartford Hospital School of Nursing); M.S. (Western Reserve University)

Instructor, Medical and Surgical Nursing

Miss Helen C. Mather, B.S. (Boston College School of Nursing); M.S. (Boston College School of Nursing)

Instructor, Medical and Surgical Nursing

Miss Derry A. Moritz, B.S. (Western Reserve University); M.Ed. (Teachers College, Columbia University)

Instructor, Medical and Surgical Nursing

Miss Jane E. Nicholson, R.N. (Mt. Auburn Hospital School of Nursing); B.S. (University of Utah School of Nursing); M.S. (Boston University School of Nursing)

Assistant Professor, Medical and Surgical Nursing

Miss Alice Norman, R.N. (Westchester School of Nursing); B.S. (Western Reserve University); M.S. (Western Reserve University)

Instructor, Medical and Surgical Nursing

Miss Mary J. Schank, B.S.N. (University of Wisconsin School of Nursing); M.S. (University of Colorado)

Instructor, Medical and Surgical Nursing

Miss Dorothy L. Sexton, R.N. (St. Raphael School of Nursing); B.S. (Boston College School of Nursing); M.S. (Boston University School of Nursing)

Assistant Professor, Medical and Surgical Nursing

Psychiatric-Mental Health Nursing:

Mrs. Mae B. Hall, R.N. (St. Barnabas Hospital for Women and Children); B.S.N.E. (Marquette University); M.S. (Boston University School of Nursing)

Assistant Professor, Psychiatric-Mental Health Nursing

Miss Charlotte Hoglund, R.N. (Memorial Hospital, Worcester); B.S. (University of Virginia); M.Ed. (Teachers College, Columbia University)

Instructor, Psychiatric-Mental Health Nursing

Mrs. Helen M. Whitbeck, B.S.N.E. (Marquette University); M.S. (Boston University School of Nursing)

Assistant Professor, Psychiatric-Mental Health Nursing

Public Health Nursing:

Mrs. Bettye A. Frederic, B.S. (Dillard University School of Nursing); M.S. (Boston University School of Nursing)

Instructor, Public Health Nursing

Mrs. Constance Petrunenko, R.N. (Children's Hospital School of Nursing); B.S.N. (Boston University School of Nursing); M.A. (Columbia University)

Assistant Professor, Public Health Nursing

Graduate Program:

Miss Ida M. MacDonald, B.A. (University of Montana); R.N. (Presbyterian Hospital School of Nursing); M.A. (University of Minnesota)

Associate Professor of Nursing

PART-TIME

Mrs. Kathryn B. Nickolls, B.S. (University of Oklahoma); A.D.A. (University Hospital, University of Michigan)

Lecturer, Clinical Nutrition

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mmr

FACULTY ACTIVITIES

July 1, 1966 - June 30, 1967

In addition to their regular administrative, teaching and counseling activities, the Faculty of the School of Nursing has participated individually and collectively as follows:

A. Participation in the planning and implementation of educational and other services within the University:

1. All-University Committee Membership and Other Services:

Academic Affairs:

Dorothy L. Sexton

Academic Matters and Subcommittee on Core Curriculum:

Gellestrina T. DiMaggio

Admissions and Records:

Mary E. Gilmore

Calendar Planning Board:

Edith G. Walker

Dean's Council:

Mary A. Maher

Distinguished Teacher of the Year:

Edith G. Walker

Graduate School:

Council -

Ida M. MacDonald
Mary A. Maher

Sub-committee on Qualifications -

Ida M. MacDonald

Health Council:

Constance Petrunenko

Library Committee:

Jane E. Nicholson

Master Planning Committee:

Mary A. Maher

Senate:

Mary E. Gilmore
Mary A. Maher
H. Constance Mather

Summer Session:

Virginia Earles (commencing 2/1/67)
Mary E. Macdonald (to 1/31/67)

Tenure and Grievance:

Mary E. Gilmore

Residential College:

Faculty Fellow -

Gellestrina T. DiMaggio - Eugene Field House

Mary E. Gilmore - Thoreau House

2. School of Nursing Committee Membership:

Faculty Organization:

Mary A. Maher, Chairman
All full-time Faculty

Curriculum:

Mary E. Macdonald, Chairman
Charlene Phelps, Co-Chairman
Bettye A. Frederic, Secretary
Gellestrina T. DiMaggio
Virginia Earles
Charlotte Hoglund
E. Ann Sheridan

Faculty Development:

Mary E. Gilmore, Chairman
Derry A. Moritz, Secretary
H. Constance Mather
Mary J. Schank
Helen M. Whitbeck

Admissions and Promotions:

Benita C. Martocchio, Chairman
Karen R. Johnson, Secretary
Mary F. Condron
Ida M. MacDonald
Mary E. Macdonald

Library:

Jane E. Nicholson, Chairman
Alice Norman, Secretary
May B. Hall
Constance A. Petrunenko
Loretta R. Sharp
Edith G. Walker

Records:

Mary F. Condron, Chairman
Loretta R. Sharp, Secretary
Rita Kisting

School Affairs:

Rita Kisting, Chairman
Martha L. Newman, Secretary
Elizabeth A. Clarke
Dorothy L. Sexton

Committee on Committees

Elizabeth A. Clarke, Convenor
Gellestrina T. DiMaggio
Mary E. Gilmore
Jane E. Nicholson
Dorothy L. Sexton

Advisory Council to Dean:

Mary A. Maher, Chairman
Mary E. Macdonald, Secretary
Gellestrina T. DiMaggio
Virginia Earles
Mary E. Gilmore
Ida M. MacDonald
Charlene Phelps
Loretta Sharp
E. Ann Sheridan

Faculty Personnel Advisory Committee:

Mary E. Gilmore, Chairman
Ida M. MacDonald, Secretary
Elizabeth A. Clarke
Mary F.Condron
Gellestrina T. DiMaggio
Virginia Earles
Jane E. Nicholson

Graduate Program:

Ida M. MacDonald, Chairman
May B. Hall, Secretary
Gellestrina T. DiMaggio
Virginia Earles
Mary E. Gilmore
Mary E. Macdonald
Mary A. Maher
Loretta R. Sharp

Interagency:

Springfield Hospital -

Mary E. Macdonald, Chairman
Mary E. Gilmore, Secretary
Gellestrina T. DiMaggio

Wesson Maternity Hospital -

Mary E. Macdonald, Chairman
Edith G. Walker, Secretary
Gellestrina T. DiMaggio
Bettye A. Frederic

Wesson Memorial Hospital -

Mary E. Macdonald, Chairman
Mary F. Condron, Secretary
Jane E. Nicholson
Virginia Earles

Northampton State Hospital -

Mary A. Maher, Chairman
Helen M. Whitbeck, Secretary
May B. Hall
Charlotte Hoglund

Springfield Health Department & Visiting Nurse Association -

Mary A. Maher, Chairman
Constance A. Petrunenko, Secretary
Mary E. Gilmore
Edith G. Walker

Administrative Coordinators:

Springfield Hospital -

Gellestrina T. DiMaggio

Health -

Constance A. Petrunenko

Nursing Club:

Dorothy L. Sexton - Advisor

Charlene Phelps - Co-Advisor

B. Participation in the planning and implementation of programs related to improvement of patient care and nursing education:

1. Professional Organization Activities:

Elizabeth A. Clarke	Member:	Board of Directors Legislative Committee	Mass. Nurses Association District I
Gellestrina T. DiMaggio	Member:	Program Committee for Clinical Nursing Programs	Mass. League for Nursing
		Nursing Council	New England Board of Higher Education for Nursing
Mary E. Gilmore	Member:	Scholarship Committee	Mass. League for Nursing
		Board of Directors Committee on Disaster Nursing	Mass. Nurses Association
		Nursing Council	New England Board of Higher Education for Nursing
Mary A. Maher	Member:	Board of Registration in Nursing	Mass. Board of Registration in Nursing
		Review Panel - Projects for Nursing Education	U.S.P.H.S. Division of Nursing, Washington, D.C.

	Council on Children & Youth	Mass. Committee on Children & Youth
Benita C. Martocchio	Secretary	Mass. Nurses Association EACT Section
H. Constance Mather	Member: Program Committee	Mass. Nurses Association District I
Charlene Phelps	Vice-Chairman	Mass. Nurses Association EACT Section
Constance Petrunenko	Member: Board Program Committee	Western Mass. Heart Association

2. Consultation:

Elizabeth A. Clarke	Wesson Memorial Hospital "Planning for the Initiation of Team Nursing" (Summer, 1966 - 20 days)	Springfield, Mass.
Mary E. Macdonald	Henry Heywood Hospital School of Nursing	Gardner, Mass.
	Holyoke Hospital School of Nursing	Holyoke, Mass.
	Somerville Hospital School of Nursing	Somerville, Mass.
	Melrose-Wakefield Hospital School of Nursing	Melrose, Mass.
Virginia Earles	Somerville Hospital School of Nursing "Evaluation" (4 days)	Somerville, Mass.
Mary E. Gilmore	Berkshire Community College Nursing Study Group ($\frac{1}{2}$ day)	Pittsfield, Mass.
Dorothy L. Sexton	Somerville Hospital School of Nursing "Curriculum Planning and Teaching" (Summer, 1966)	Somerville, Mass.

Ida M. MacDonald	Franklin County Public Hospital	Greenfield, Mass.
	Staff Development (26 ½-days)	
	Nursing Committee and Research Team (5 days)	

3. Regional Nursing Program (NECHEN):

Ida M. MacDonald	Director of Program (Spring & Fall Conferences 10 days)	University of Massachusetts
	Member: Committee on Graduate Program (2 meetings)	New Haven & Boston College
	Planning for 1967-68 Work Conferences	Winchester, Mass.
	Annual Forum	Boston, Mass.
Virginia Earles	Speaker and Resource Person at Work Conference "Nursing Needs of the Adult Patient with a Cardiac Disorder"	University of Massachusetts
Loretta R. Sharp	Speaker and Resource Person at Work Conference "Cardiac Problems in Children: Nursing Implications"	University of Massachusetts
Elizabeth A. Clarke	Speaker and Resource Person at Work Conference "Nursing Care Plans: Development and Use"	University of Massachusetts
Dorothy L. Sexton & Charlotte Hoglund	Speaker and Resource Persons at Work Conference "Teaching the Patient With Emphysema"	University of Massachusetts
Mary F. Condron	Director, Work Conference for Directors and Supervisors of Nursing Homes	University of Massachusetts

4. Other:

Mary E. Gilmore	Speaker: "Nursing Care of Patients with Acclusive Vascular Disease" (April 27, 1967)	Western Mass. Heart Association - Pittsfield, Mass.
Ida M. MacDonald	Speaker: "Current Trends in Nursing" (March 29, 1967)	Springfield Hospital Alumnae Association - Springfield, Mass.
	Speaker and Resource Person "Evaluation of Nursing Services" (May 24, 1967)	Mass. Nurses Association Section of Nursing Service Administrators, District II - Sudbury, Mass.
	Speaker: "Continuing Education in Nursing" (April 5, 1967)	Greenfield Community College - Greenfield, Mass.
Charlene Phelps	Speaker: "Nursing Care of the Cardiac Patient" (April 27, 1967)	Western Mass. Heart Association - Springfield, Mass.
Virginia Earles	Director and Principal Resource Person - Workshop for 24 Registered Nurses (June 5-16, 1967)	University of Wisconsin - Milwaukee
Benita C. Martocchio	Member: Interdisciplinary Committee - Problem Areas of Gerontology	University of Massachusetts Institute of Labor Relations and Research
	Amherst League of Women Voters - "Operation Friendship" (Problems of migrant workers in Hampshire Co.)	

Gellestrina T. DiMaggio	Member: Board of Directors - Child Guidance Clinic	Springfield, Mass.
	Corporator: Springfield Day Nursery	Springfield, Mass.
	Member: Advisory Committee - Greenfield Community College	Greenfield, Mass.
H. Constance Mather	Captain: Air Force Reserve 2nd Medical Service Squadron	Westover Field, Mass.
Jane E. Nicholson	Assistant Chief Nurse: New Hampshire Air National Guard - Auromedical Evacuation Flight	Manchester, New Hampshire

FACULTY ATTENDANCE AT PROFESSIONAL MEETINGS

Date	Meeting	Place	Faculty Member(s) Attending
9/26/66	Mental Health Conference	Boston, Mass.	May B. Hall Charlotte Hoglund Helen Whitbeck
9/30/66	N.L.N. North Atlantic Structure of N.L.N.	New York City	Gellestrina DiMaggio
10/66	Annual Meeting - District I Mass. Nurses Association	Lee, Mass.	Mary E. Gilmore Charlotte Hoglund Rita Kisting Benita Martocchio H. Constance Mather Alice Norman Charlene Phelps Helen Whitbeck
10/24-28/66	Institute for Instructors of Disaster Nursing	Framingham, Mass.	Charlotte Hoglund
11/16-18/66	Council of Member Agencies, Baccalaureate and Higher Degree Programs, N.L.N.	Seattle, Washington	Virginia Earles
2/67	Annual Meeting - Western Mass. Heart Association	Springfield, Mass.	Charlotte Hoglund Constance Petrunenko Edith Walker
3/6/67	Annual Meeting - Child Study Association	New York City	Gellestrina DiMaggio Martha Newman E. Ann Sheridan
3/23-26/67	Annual Meeting - American Orthopsychiatric Association	Washington, D.C.	Loretta Sharp Helen Whitbeck
4/31-4/1/67	Columbia University School of Nursing - Symposium: Interdisciplinary Teaching of Psychosocial Aspects of Nursing Care	New York City	Charlotte Hoglund
4/2/67	Section of Nursing Service Directors, District II, Mass. Nurses Association	Worcester, Mass.	Ida MacDonald
4/19/67	Interprofessional Care of the Ambulatory Patient	Williamstown, Mass.	Gellestrina DiMaggio (Group Leader)

Date	Meeting	Place	Faculty Member(s) Attending
4/11/67	Symposium on Nursing Education - Lydia Hall, Loeb Center	Boston, Mass.	Jane Nicholson
4/12/67	Annual Forum - New England Council of Higher Education for Nursing	Boston, Mass.	Gellestrina DiMaggio Mary Gilmore Ida MacDonald
5/5-7/67	Council of Member Agencies, Department of Baccalaureate and Higher Degree Programs, N.L.N.	New York City	Virginia Earles (Forum Leader) Rita Kisting
5/8-10/67	Biennial Convention - National League for Nursing	New York City	Gellestrina DiMaggio Mary Gilmore Jane Nicholson Mary Schank
4/19-26/67	Interuniversity Faculty Work Conference - New England Board of Higher Education for Nursing Biophysical Constructs in Curriculum Planning	Chatham Bars, Mass.	21 Faculty Members attended - all but Mary Gilmore and Charlotte Hoglund
6/19-26/67	National Training Laboratory	Bethel, Maine	Mary Gilmore

UNIVERSITY OF MASSACHUSETTS
School of Nursing

PHILOSOPHY OF NURSING

Nursing is recognized as one of the major health services to people, therefore the health needs of people must dictate its design. The concept of health today encompasses the idea of complete physical, mental and social well-being and not merely the absence of disease and infirmity. As society has become more complex, diseases have become multicausal and new complications arise in procuring the delivering appropriate services to patients.

Nursing intervention is essential to man when stress endangers his life, threatens or alters his health sufficiently to keep him from coping with his stresses. Nursing, like other health disciplines, considers as its goals protection of people from health hazards, promotion of health through teaching, prevention of disease and disability, and the training of people through the process of habilitation and rehabilitation.

Nursing is an art requiring the systematic application of understandings, knowledges and skills to provide an unique service essential to the well-being of man. Nursing utilizes a dynamic, therapeutic, educative process through which the patient is assisted to attain, maintain and accept his optimum state of health.

The services provided to patients may be direct (care, comfort, nurture) and indirect (cure, coordinating, teaching), however, the essence of professional nursing is ministering to the basic human needs of people in times of stress. As a profession, nursing takes on the responsibilities of maintaining levels of practice, examining practice and developing new knowledge and skills, and developing ways of teaching and preparing new practitioners.

Professional nursing education prepares the individual to exercise discriminative judgment, to think creatively, to utilize reflective thinking, critical thought, problem-solving and critical analysis in varying situations in the home, the hospital and the community. Not only substantive knowledge but the understandings essential to coping with change and to becoming an agent committed to caring for people are transmitted to the student.

5/19/67

UNIVERSITY OF MASSACHUSETTS
School of Nursing

CURRICULUM COMMITTEE

January 9, 1967

Tentative Position Statement: Role of University School of Nursing

I. Assumptions:

The assumptions underlying the development of this statement are:

A. General:

- The nature and complexity of health services will demand an increasing number of highly qualified nursing personnel.
- The quality of nursing services is directly influenced by the educational preparation of personnel providing this service.
- There will be a continuing need for practitioners of nursing prepared at the technical level and the professional level.
- Expansion of programs of nursing will be affected by the availability of qualified faculty.
- The needs and resources available for the preparation of nurse practitioners will vary within geographic areas of the Commonwealth.
- Planning and action for transition in nursing education will be achieved by professional nurses in cooperation with representative planning groups.

B. Nursing Education:

- The education of those who work in nursing should take place in institutions of learning within the general system of education.
- The education for all those who are licensed to practice nursing should take place in institutions of higher education.
- The minimum preparation for beginning professional nursing practice at the present time should be baccalaureate degree education in nursing.
- The minimum preparation for beginning technical nursing practice at the present time should be associate degree education in nursing.
- The education for assistants in the health service occupations should be short, in ensive preservice programs in vocational education.
- The Master Plan for Public Education in Massachusetts, December, 1964 includes provisions which would permit the establishment of professional, technical and vocational programs of nursing education within the general system of public-supported higher and vocational education within the Commonwealth of Massachusetts.

- The present and projected demands for health manpower to meet the present and future needs of society make imperative an orderly expansion of nursing education programs within the state-supported system of education, as well as a concomitant clarification of the respective educational goals of each type of program.

- The faculty of the University School of Nursing must address themselves to collaborative efforts geared to solving the problems inherent in the process of transition and assume appropriate leadership responsibilities in developing a blueprint for action to meet the nursing needs of the people in the Commonwealth.

C. Role of the University:

- The unique idea and spirit of the University requires a differentiation in its role and function within the system of higher education. Its two-fold responsibility to infuse a spirit of imaginative rationality into the surrounding culture and society, while concurrently bringing the consideration of human need into its deliberations and decisions requires that in addition to an imaginative consideration of learning, appropriate attention be given to the structuring of objective and valid knowledge which is related to human need.

- In addition to the general teaching function, the role of the University encompasses:

  - the specialized research and scholarly function,
  - the training of new specialists,
  - the education of professionals,
  - extramural consultation and teaching, and
  - applied research.

- The University assumes a special role in the task of interrelating the meaning of the various branches of knowledge and of cultivating persons able to see these relationships and use them in their thinking and choosing. The emphasis is on the development of general intellectual competence in potential leaders, who can in turn redefine and articulate the values of society and unite its members in the pursuit of worthy objectives.

D. Role of the University School of Nursing:

Within this general frame of reference, the role and function of the University School of Nursing must be differentiated from that of other professional schools of nursing, with appropriate emphasis on:

- the identification and development of nursing leaders at both the undergraduate and graduate level.

- the advancement of nursing knowledge through research, including organized and continuous study of nursing problems and the preparation of nurse investigators and theorists.

- the creation of social systems within which nursing care, nursing education and nursing research can all flourish - each function enhancing the other.

- imaginative and innovative approaches to learning and teaching.

- collaborative effort and progressive action in solving the problems inherent in the current transitional period of nursing and nursing education.

II. Position Statement: Role of University of Massachusetts School of Nursing:

A. Teaching:

1. To provide a basic professional program which has the following attributes:

   a. outstanding in entrance requirements and demand for achievement.
   b. offers special focus towards preparation for graduate work.
   c. the curriculum is flexible to allow for experimentation and research in collaboration with the graduate program.

2. To provide graduate preparation for research, teaching, advanced clinical specialization in nursing.

D. Research:

1. To assume responsibility for the structuring and verification of nursing knowledge through systematic inquiry.

2. To provide opportunities for the advancement of individual faculty competence in area of specialty.

C. Service:

1. To assume a leadership role in the development of a blueprint for action in the expansion and coordination of nursing education programs in public institutions of learning within the Commonwealth.

2. To participate in extramural consultative, teaching and continuing education programs.

MEM:mmr
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ANNUAL REPORT
SCHOOL OF PHYSICAL EDUCATION
June 1967

1 Appropriations

Account/Year	1964-1967	1965-1966	1966-1967
03	$36,259	$31,300	$35,900
06	6,900	7,400	4,000
07	7,000	7,000	8,000
09	3,000	3,000	-0-
10	3,940	5,100	5,200
11	200	200	44
12	3,398	4,600	8,350
13	18,850	28,100	25,000
14	2,330	3,500	3,500
14[1]	6,000	6,000	8,000
15[2]	3,400	4,000	6,500
16	500	200	300

2. Personnel[1]

	1964-1965	1965-1966	1966-1967
Dean	1	1	1
Associate Dean	0	0	1
Assistant Dean	1	1	0
Department Head	2	2	2
Professor	3	5	5
Associate Professor	6	6	6
Assistant Professor	5	7	7
Instructor	11	12	14
Part-Time Instructor	2	1	1
Assistant Athletic Dir.	1	1	1
Head Coach	2	2	2
Intramural Dir.	1	1	1
Asst. Football Coach	2	2	2
Athletic Coach	4	4	4
Asst. Athletic Coach	3	3	3
Financial Manager of Athletics[2]	1	1	1
Sports Information Dir.[2]	1	1	1
Asst. Sports Information Dir.[2]	1	1	1
Ticket Manager[2]	0	0	1

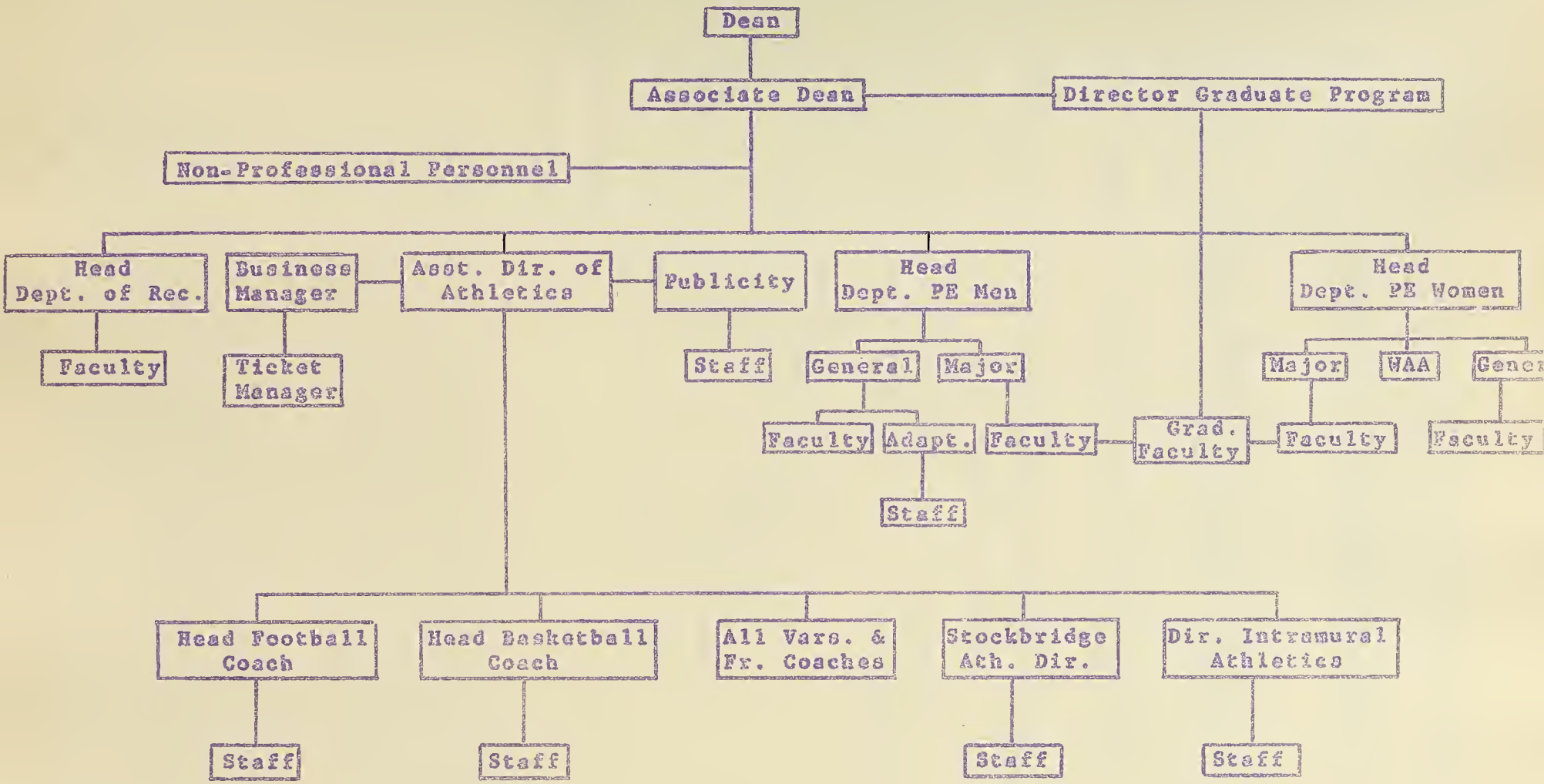
3. Organization Chart for 1967-1968 - see attached chart.

4. Students or clientele served[1]

	Sept.1964	Sept. 1965	Sept. 1966
Number of Graduate Students	16	23	44
Number of Undergraduate Majors	333	380	489
Number of Students Taught	5672	6520	7411
Athletic Team Membership	788	805	901
Intramural Participation	3165	3275	4727

[1]See Appendix for Departmental Breakdown.
[2]Paid from Athletic Trust Funds

SCHOOL OF PHYSICAL EDUCATION



5. Faculty Publications

a. Bischoff, David C., "The Practicing Physical Educator: Administrator," Quest, VII: 14-18, December 1966.

Ricci, Benjamin, Physical and Physiological Conditioning for Men, 1966. (63 pages).

b. Papers presented:

Hubbard, E. Vickery. "What Research Tells us About the Function of Kinesthesia in Visual Perception." Eastern Association for Physical Education of College Women, October, 1966.

Coffey, Margaret A., "Historical Contributions of Selected Physical Educators," Trenton State College, February, 1967.

c. Professional Activities: School faculty represented the University at the following conferences during the year:

National Conference for Deans of Physical Education
American College of Sports Medicine
National College Physical Education Association for Men
National Park and Recreation Congress
International Symposium on Physical Activity and Cardiovascular Health
New England Park and Recreation Conference
National Conference on International Relations WPE
National Conference on Elementary School PE
Eastern Association for P. E. of College Women
American Assoc for Health, P. E. and Recreation
Massachusetts Assoc. for Health, P. E. and Recreation
Academy of Aquatic Art
National Conference of District Presidents of AAHPER

6. Major Accomplishments

a. Department of Athletics
(1) Intramurals

The Intramural Program has grown considerably over the past few years and is being accepted with enthusiasm and interest on the part of the undergraduates, graduates and faculty. It was our objective to continue in this same manner and improve overall participation. This was accomplished since individual participations in the 15 sports activities increased by 19% (5,991), while total participations increased 9% (20,195).

Overall, team sports increased by 26% in individual participation and 15% in total participation. This was due to marked increases in individual and total participations in Soccer, Volleyball, Football, and Basketball; Soccer especially showed an increase of 78% in individual participations and a 101% in total participations.

Individual sports increased by 14% in individual and 25% in total participations. The sport that showed greatest increase was Cross Country, (196%) in individual and total participations. Wrestling and Swimming also had large participations and are enthusiastically entered into by our undergraduates.

On the basis of an individual countdown, there are 3,239 students out of a male student body of 5,816 or 56% taking an active part in our program. Our objective next year will be to reach all male students not engaged actively and interest them to become active participants in the Intramural Athletic Program.

(2) Intercollegiate Athletics

The Frank W. Keaney Trophy, symbolic of overall athletic supremacy in the Yankee Conference, was retained for the third straight year by the University of Massachusetts. In Conference championship play, the University of Massachusetts was first in baseball, cross-country, football, indoor track, and outdoor track. Golf and soccer finished second, and basketball and rifle were third.

The University of Massachusetts fared well in contests beyond the Conference scope. The varsity basketball team participated in the Oklahoma City Tournament and the Boston Garden Holiday Tournament, defeating 2 out of 3 teams played in the former and reaching the finals in the latter tourney. The baseball team, in winning the Yankee Conference, qualified for the NCAA Regional District I playoffs and reached the final round before being eliminated in a 2 out of 3 series. Jack Leaman (basketball) and Dick Bergquist (baseball) were in their first year as varsity head coaches. Homer Barr, in his first year as wrestling coach, did an excellent job in reviving the interest in wrestling.

Special events and contests were performed on campus during the year. The N. A. I. A. District 32, 1966 Soccer Championship Playoffs were held on November 16. A closed television circuit in the Boyden Gym was installed to accommodate the overflow crowd at the UMass - Boston College basketball game. The 26th Annual North-South Lacrosse Game was held in Alumni Stadium on June 10. The University lacrosse team hosted the Australian lacrosse team in an exhibition game on the 10th of May in the Stadium.

Clinics were conducted in football, basketball, baseball, wrestling, and gymnastics under the supervision of the coaching staff in each sport.

Student participation in the overall athletic program showed an increase over the past year. Greater participation by the student body in the athletic program is one of the objectives of the administration. A junior varsity program will absorb the overflow of personnel on the varsity squads, and

thereby offer them an opportunity to compete against outside competition.

b. Department of Physical Education for Men

(1) Undergraduate Professional Preparation Program

Faculty Recruitment

The Department was very successful in its recruiting effort this past year. Four new senior faculty of national prominence will be joining the staff in the fall. Included in this group is a new Men's Department Head.

Student Teaching

During the past year thirty-two majors were placed and supervised in sixteen cooperating schools. Arrangements have been completed for the addition of four new schools for next year.

Seminar meetings for interning student teachers, where critical issues pertaining to their particular assignments are discussed with the department faculty, have continued. The effectiveness of this approach toward teaching preparation has been highly endorsed by both students and faculty.

(2) General Program

The caliber of the General Program continues to be reflected in the genuine interest displayed by students enrolled in the program. This interest results from the high level of instruction, the broad selection of activities offered, the instruction environment, equipment and supporting services.

Outcomes to the student are evidenced by their voluntary participation in a variety of activities during periods of "free play" in which facilities and equipment are available during the late afternoons, evenings and weekends. The stigma of compulsion attached to the "required" aspect of the program is no longer in evidence. Physical Education is viewed by the student as an educational, rather than a perspirative experience--an attitude which is not readily attained and one which should be fostered.

The Therapeutic Exercise Unit was conducted from 3:30 to 5:30 Monday through Friday. This unit averaged 35 students per six weeks period for four periods. An average of over 100 treatments per week were administered. The types of modalities and testing used are progressive resistive exercise, passive exercise, active exercise, muscle re-education, manual muscle testing, range of motion testing, gait analysis, electrical testing and general conditioning.

Adapted sports and follow-up therapy have been offered to students beyond the required program if medically indicated.

c. Department of Physical Education for Women

(1) Undergraduate Professional Program

The growth in quantity and quality is evident. Fifteen of the junior majors were eligible for Department Honors and five women chose to participate. Three women were selected by Scrolls and three chosen for Mortar Board membership. The entire undergraduate quality point average has shown improvement.

The department has embarked upon the new curriculum for the class of 1970. The Major Council composed of representatives of each class has established an excellent rapport in meeting student needs. A speaker, Celeste Ulrich of the University of North Carolina was invited to the campus by this Council.

(2) Dance Education

The department sponsored three workshops bringing Murray Louis, William Castanza and Brigit Facius to the campus. The University summer Fine Arts program will fund a week-end workshop with Erick Hawkins and the Fine Arts Council has allocated funds for next year to bring another dancer-choreographer to the campus. The dance concert presented this spring was excellent.

(3) T. V. Teaching

The use of television as a teaching tool has been utilized by many of the faculty. This has benefitted the prospective teacher training program. The spring visitation to public schools for observation and consultation with cooperating teachers was most rewarding. The improvement of the department program in the past few years was evident.

(4) General Program

The introduction of ice (figure) skating into the program was popular. The inclusion of many intermediate activities has been successful. A survey of those students completing their requirement indicated that 89% of the women considered the program valuable.

(5) Summer Gymnastic Workshop for Women

This workshop was well received by those attending. By request it will be repeated this summer and the enrollment indicates interest throughout New England. In the future the department hopes to offer other workshops of interest to professional personnel.

d. Department of Recreation

The results of last year's curriculum revision have already been noted in increased application for admission to the program.

e Graduate Program

Increased enrollment continues to describe the graduate program in physical education. The number of graduate students (men and women) nearly doubled -- from twenty-three to forty-four -- from the last report year to the subject period. Three new courses were added to strengthen the master's program and several new departmental admission requirements were introduced in an attempt to improve the quality of the students entering the program. The policies governing advancement to degree candidacy were reinforced to provide an opportunity for an appraisal of each student's work between admission and completion of the degree requirements. The concept of variable thesis credit was introduced to recognize the quality differential of master's theses.

7. Special Programs

a. Recruiting

An all-out effort was made to recruit faculty to our School of Physical Education who would qualify immediately for graduate faculty status. This search resulted in the appointment of four new men with the necessary qualifications and represents the major accomplishment in the category of "special projects" for the subject period. These men are coming to Massachusetts in the senior professorial ranks, an attestation to the fact that they are not coming to us with the minimum prerequisites for appointment to the graduate faculty.

b. Summer Workshop

The second summer workshop for women will be offered this summer in gymnastics. It is one of the School's efforts to upgrade teaching, to provide for continuing adult education, and to reach a new potential public for the graduate program of the School. It has proven to be very successful and well received.

8. Future Plans and Needs

a. Athletic Department

(1) The development of Plot 2 is projected to be started this fall and will provide desperately needed outdoor facilities. Additional funds will be needed to replace existing tennis courts when Bartlett West construction is begun.

(2) A Hockey Arena which would include dressing facilities for Athletic teams is badly needed.

b. Department of Physical Education for Men

The number of full-time staff required to meet future instructional needs will be proportionate to enrollment increases and planned program expansion provision of modern indoor facilities and the future development of outdoor instructional areas.

The extent to which graduate assistants may be used to supplement full-time staff is dependent upon the number of assistantships allocated to the Department. In the interest of maintaining the high caliber of instruction and the respect that the program enjoys, as a part of the University core curriculum, it is essential that at least 50% of the instructional load in this area continue to be assigned to the full-time faculty.

c. Department of Physical Education for Women

1. The most critical need of the Department continues to be the need for an addition to the Women's Gymnasium. This must be realized in the near future in order to maintain the excellent quality of instruction.

2. Additional faculty will be needed in graduate work, aquatics and elementary school physical education. With the implementation of the new Massachusetts law on physical education of K-12, the University must provide teachers and leadership. The department accompanist has made himself most valuable in assisting in Analysis of Rhythm, gymnastics taping for free exercise, the total dance education program, and Naiads production. In many universities the accompanist is a full-time employee. The department needs the same. Also, the need for a clerk is critical.

3. The programs that can be either initiated or augmented by this department will depend upon the above two recommendations. The department has an excellent future with the competencies of the present personnel, but growth will depend on continued support by the University.

d. Department of Recreation

Departmental needs continue for remodelling and renovation of space in Hicks. Requests for this work are being submitted on a unit basis so that each segment of the building will be ready for use when needed.

In long-range view three future programs are considered to be important possibilities. First, a graduate program should be inaugurated as soon as the department is assured of adequate resources to support it. At least some of the emphasis will be on interdepartmental cooperation such as through the anticipated broadly-based graduate program in regional planning.

Secondly, a strong research effort is much needed nationally and this department is anxious to plan an important part in it when the graduate program becomes a reality. The possibility of becoming the location for one of the proposed federally-supported Outdoor Recreation Research & Training Units is being pursued by this department.

Thirdly, there are many types of important extension services in recreation which are needed by various agencies, governmental units, and commerical enterprises throughout the Commonwealth. Three approaches to the provision of such services have been tried in a number of states. The least successful device is a state interagency-committee which in Massachusetts is restricted to outdoor recreation. A few states have established a state recreation board. These have been markedly successful in some states, but the prospects in Massachusetts are dim. The third approach, that of a Recreation Extension Service emanating from the state university, offers several strong advantages and seems most appropriate in Massachusetts.

e. Graduate Program

The School of Physical Education plans to initiate a Ph.D. program in 1969. This program will be unique and of the highest quality. To realize this goal we will require continued support by the University Administration and Trustees in terms of new faculty, additional courses, expanded library holdings and especially in terms of additional monies for research equipment.

f. Summary

Critical needs of the School in the immediate future are:

(1) Hockey Arena
(2) Addition to Women's Physical Education Building
(3) Significant increase in the School's #15 Account Budget.

APPENDIX

Personnel by Department

1. Department of Physical Education for Men

	1964-65	1965-66	1966-67
Department Head	1	1	1
Professor	2	4	4
Associate Professor	2	1	1
Assistant Professor	3	3	3
Instructor	6	6	7

2. Department of Physical Education for Women

	1964-65	1965-66	1966-67
Department Head	1	1	1
Associate Professor	4	4	4
Assistant Professor	3	5	4
Instructor	4	4	5
Part-Time Instructor	2	1	1

3. Department of Recreation

	1964-65	1965-66	1966-67
Professor	1	1	1
Assistant Professor	*	0	0
Instructor	1	2	2

Students Served by Department

1. Department of Physical Education for Men

	1964-65	1965-66	1966-67
Majors	191	210	253
General Program	2202	2600	3125
Students Taught	2969	3440	4137

2. Department of Physical Education for Women

	1964-65	1965-66	1966-67
Majors	90	137	180
General Program	2127	2277	2552
Students Taught	2479	2821	3064

3. Department of Recreation

	1964-65	1965-66	1966-67
Majors	34	33	61
Students Taught	134	181	210

*One Assistant Professor on leave.

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